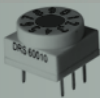
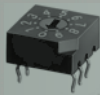




# 6 Rotary Coded Switches



Series	Size / Foot print	Shaft		standard	Mounting			Page
		w	w.o.		right angle	front-panel	SMT	
DRS 3000/4000		•	•	•				148
DRR 3000/4000		•	•		•			148
SMR 5000			•	•			•	149
DRS 20 000/21 000		•	•	•				150
DRR 20 000/21 000		•	•		•			150
SMR 20 000			•	•			•	151
DRS/DRR/SMR 60 000/61 000		•	•	•	•		•	152 153
DRS 7000/8000		•	•	•				154
DRR 7000/8000		•	•		•			154
SMR 7000-1/8000-1		•	•	•			•	155
SMRR 7000-1/8000-1		•	•		•		•	155
DRS 13 000/14 000		•	•	•				156
SMR 13 000/14 000		•	•	•			•	157
DRS 15 000/16 000		•	•	•				158
SMR 15 000/16 000		•	•	•			•	159
DRS 20		•		•			•	160

All types available with the codes BCD, Hexadecimal, BCD inverse, Hexadecimal inverse.

# Subminiature Rotary Coded Switches

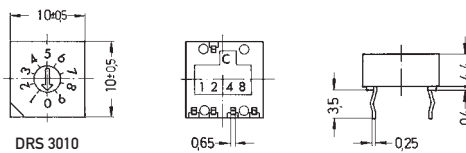


## Specifications:

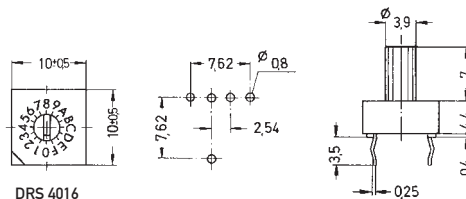
Contact rating:	50 V DC, 100 mA, non switching 15 V DC, 30 mA, switching
Contact resistance:	< 100 mΩ
Insulation resistance:	> 1000 MΩ at 250 V DC
Dielectric strength:	250 V, 50 Hz for the duration of 1 minute
Operating temperature:	- 40° to + 85° C
Mechanical life:	minimum 20 000 operations
Contacts:	gold-plated
Terminals:	PC terminals, phosphor bronze, gold-plated
Case material:	PBT black, rotor: standard types yellow; inverse types red
Construction:	case totally sealed, suitable for washing by immersion
Mounting:	on pc-board
Soldering conditions:	auto-soldering – max.: 6 sec, 275° C

washable

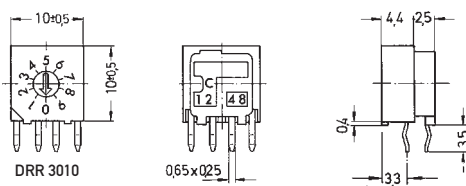
Models:	Code
DRS 3010	BCD
DRS 3110	BCD Inverse
DRS 3016	Hexadecimal
DRS 3116	Hexadecimal Inverse



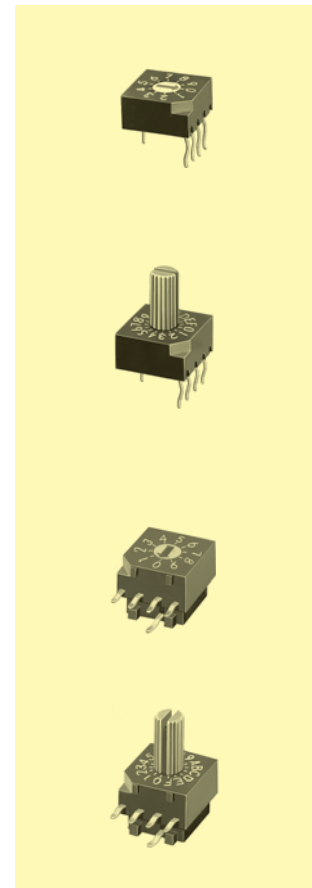
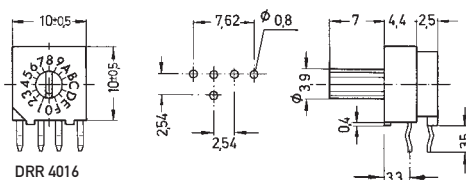
DRS 4010	BCD
DRS 4110	BCD Inverse
DRS 4016	Hexadecimal
DRS 4116	Hexadecimal Inverse



DRR 3010	BCD
DRR 3110	BCD Inverse
DRR 3016	Hexadecimal
DRR 3116	Hexadecimal Inverse



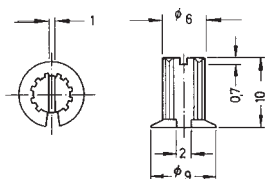
DRR 4010	BCD
DRR 4110	BCD Inverse
DRR 4016	Hexadecimal
DRR 4116	Hexadecimal Inverse



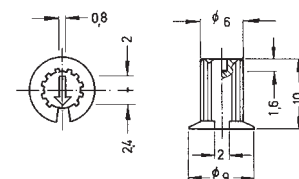
## Accessories:

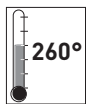
### Caps

yellow	KR 108
red	KR 109
white	KR 110



grey KR 207





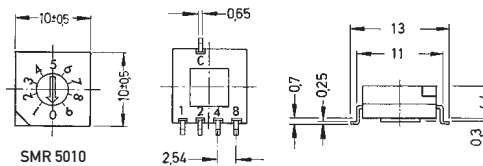
# Subminiature Rotary Coded Switches for SMT

## Specifications:

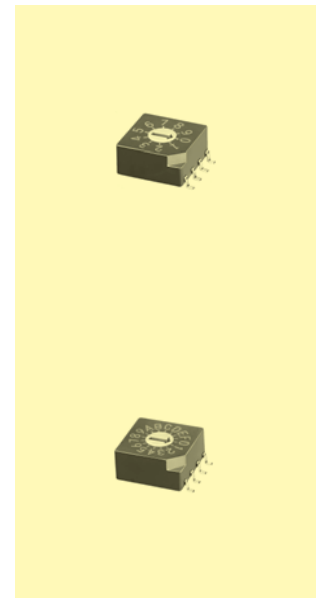
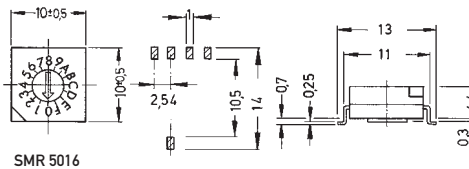
Contact rating:	50 V DC, 100 mA, non switching 15 V DC, 30 mA, switching
Contact resistance:	< 100 mΩ
Insulation resistance:	> 1000 MΩ at 250 V DC
Dielectric strength:	250 V, 50 Hz for the duration of 1 minute
Operating temperature:	- 40° to + 85° C
Mechanical life:	minimum 20 000 operations
Contacts:	phosphor bronze, gold-plated
Terminals:	phosphor bronze, gold-plated
Case material:	PPS black, rotor: standard types yellow; inverse types red
Construction:	case totally sealed with protective tape
Mounting:	on pc-board – SMD

washable

Models:	Code
SMR 5010	BCD
SMR 5110	BCD Inverse

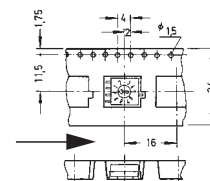


SMR 5016	Hexadecimal
SMR 5116	Hexadecimal Inverse



Packing: on tapes  
for order on tape: additional to type number: T  
example of order: SMR 5010 T

Tape 500 pieces      Reel ∅ 330 mm



# Subminiature Rotary Coded Switches



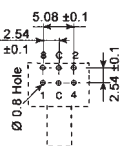
## Specifications:

Contact rating:	24 V DC, 25 mA switching
Contact resistance:	< 100 mΩ
Insulation resistance:	> 1000 MΩ
Dielectric strength:	250 V, 50 Hz for the duration of 1 minute
Operating temperature:	- 25° to + 70° C
Mechanical life:	minimum 2000 operations
Terminals:	phosphor bronze, gold-plated over nickel barrier
Material:	case: PBT blue, meets UL 94 V-0, washable, rotor: white; inverse type red
Mounting:	on pc-board
Soldering conditions:	auto-soldering – max.: 5 sec, 260° C

## Models: Code

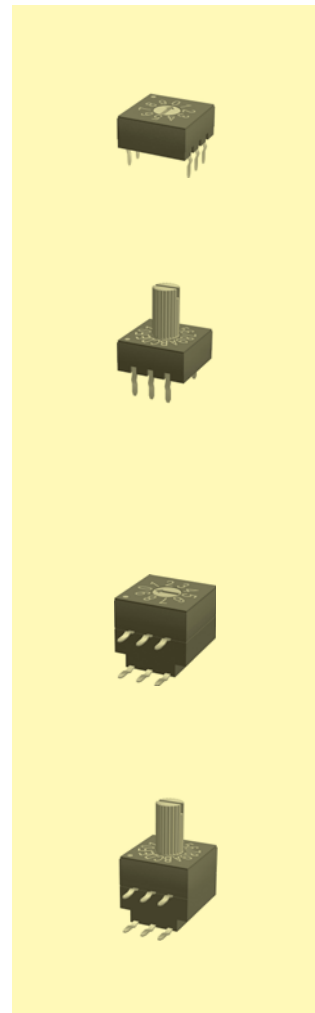
DRS 20010	BCD				
DRS 20110	BCD Inverse				
DRS 20016	Hexadecimal				
DRS 20116	Hexadecimal Inverse				
DRS 21010	BCD				
DRS 21110	BCD Inverse				
DRS 21016	Hexadecimal				
DRS 21116	Hexadecimal Inverse				
DRR 20010	BCD				
DRR 20110	BCD Inverse				
DRR 20016	Hexadecimal				
DRR 20116	Hexadecimal Inverse				
DRR 21010	BCD				
DRR 21110	BCD Inverse				
DRR 21016	Hexadecimal				
DRR 21116	Hexadecimal Inverse				

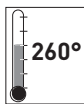
## Special version:



Spacing 2,54 mm  
 Additional to type number: -1  
 Example of order: DRR 20010-1

washable





# Subminiature Rotary Coded Switches for SMT

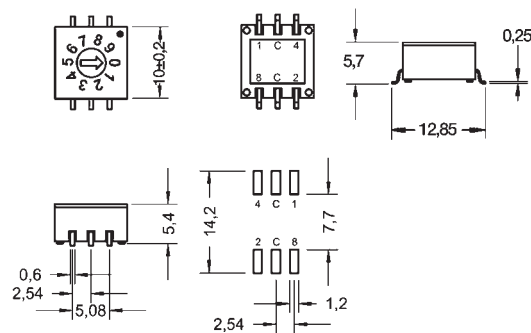
## Specifications:

Contact rating:	24 V DC, 100 mA switching
Contact resistance:	< 100 mΩ
Insulation resistance:	> 1000 MΩ
Dielectric strength:	250 V, 50 Hz for the duration of 1 minute
Operating temperature:	- 25° to + 70° C
Mechanical life:	minimum 2000 operations
Terminals:	phosphor bronze, gold-plated over nickel barrier
Material:	case: PBT black, meets UL 94 V-0, washable, rotor: white; inverse type red
Mounting:	on pc-board

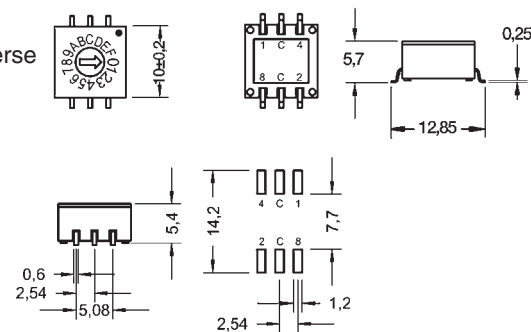
washable

## Models: Code

SMR 20010	BCD
SMR 20110	BCD Inverse



SMR 20016	Hexadecimal
SMR 20116	Hexadecimal Inverse



Packing: 700 pieces per reel

# Subminiature Rotary Coded Switches

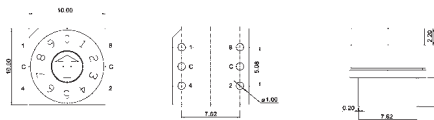


## Specifications:

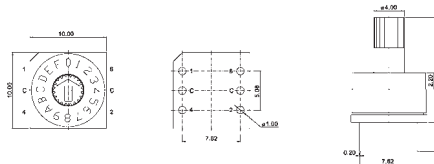
Contact rating:	24 V DC, 25 mA switching
Contact resistance:	< 80 mΩ
Insulation resistance:	> 100 MΩ
Dielectric strength:	250 V, 50 Hz for the duration of 1 minute
Operating temperature:	-20° to +70° C
Storage temperature:	-40° to +85° C
Mechanical life:	minimum 10 000 operations
Terminals:	phosphor bronze, gold-plated over nickel barrier
Material:	case: PA6T meets UL 94 V-0, cover light grey, base black rotor: grey, inverse type beige
Mounting:	on pc-board with spacing 2,54 mm
Soldering conditions:	auto-soldering – max.: 5 sec, 260° C

## Models: Code

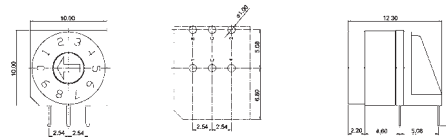
DRS 60010	BCD
DRS 60110	BCD Inverse
DRS 60016	Hexadecimal
DRS 60116	Hexadecimal Inverse



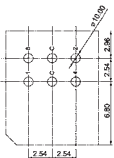
DRS 61010	BCD
DRS 61110	BCD Inverse
DRS 61016	Hexadecimal
DRS 61116	Hexadecimal Inverse



DRR 60010	BCD
DRR 60110	BCD Inverse
DRR 60016	Hexadecimal
DRR 60116	Hexadecimal Inverse

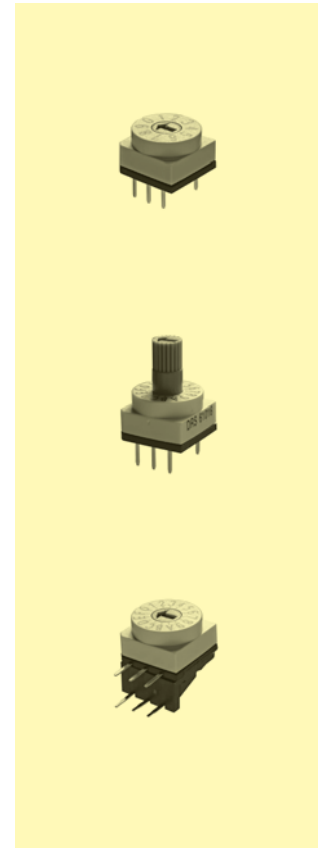


## Special version:



Spacing 2,54 mm

Additional to type number: -1





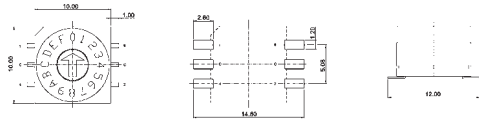
# Subminiature Rotary Coded Switches for SMT

## Specifications:

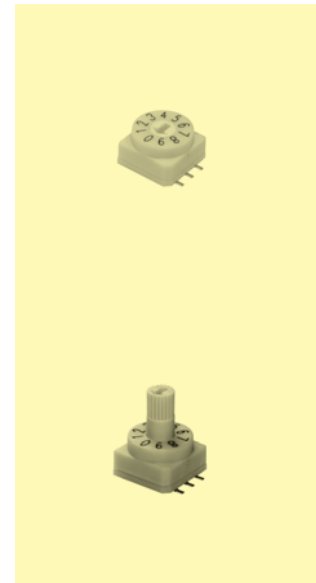
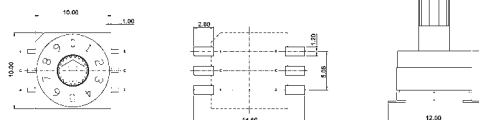
Contact rating:	24 V DC, 25 mA ss
Contact resistance:	<80 mΩ
Insulation resistance:	> 100 MΩ
Dielectric strength:	250 V, 50 Hz for the duration of 1 minute
Operating temperature:	-20° to +70° C
Storage temperature:	-40° to +85° C
Mechanical life:	minimum 10 000 operations
Terminals:	phosphor bronze, gold-plated over nickel barrier
Material:	case: PA6T grey meets UL 94 V-0 rotor: PA 66 grey, inverse type blue
Mounting:	on pc-board
Packing:	600 pcs/reel

## Models Code

SMR 60010	BCD
SMR 60110	BCD Inverse
SMR 60016	Hexadecimal
SMR 60116	Hexadecimal Inverse



SMR 61010	BCD
SMR 61110	BCD Inverse
SMR 61016	Hexadecimal
SMR 61116	Hexadecimal Inverse



Special versions on request

# Microminiature Rotary Coded Switches

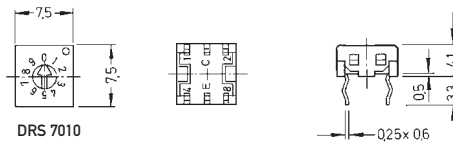
## Specifications:

Contact rating:	50 V DC, 100 mA, non-switching 15 V DC, 30 mA, switching
Contact resistance:	< 200 mΩ
Insulation resistance:	> 1000 MΩ at 250 V DC
Dielectric strength:	250 V, 50 Hz for the duration of 1 minute
Operating temperature:	- 25° to + 85° C
Mechanical life:	minimum 20 000 operations
Contacts:	gold-plated
Terminals:	PC terminals, phosphor bronze, gold-plated
Material:	case: PPS, black frame: stainless steel rotor: PA, standard types yellow; inverse types red
Construction:	case totally sealed, suitable for washing by immersion
Mounting:	on pc-board
Soldering conditions:	auto-soldering – max.: 6 sec, 260° C

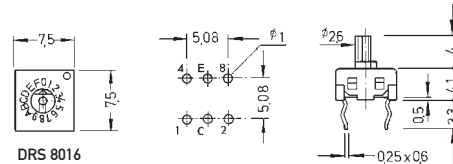
**washable**

## Models: Code

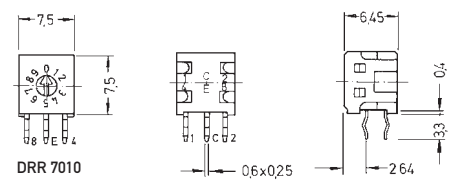
DRS 7010	BCD
DRS 7110	BCD Inverse
DRS 7016	Hexadecimal
DRS 7116	Hexadecimal Inverse



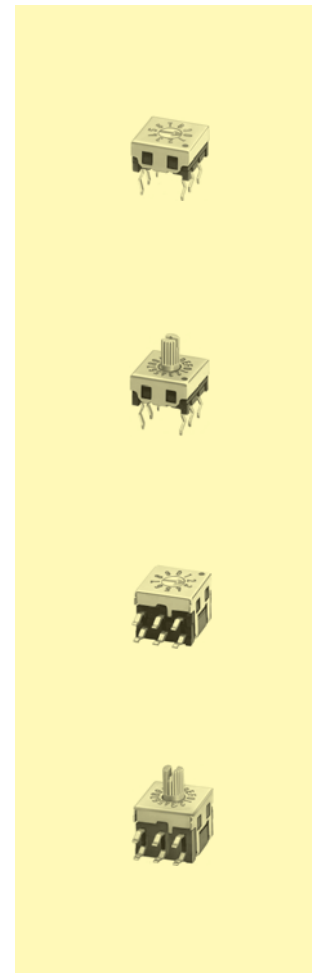
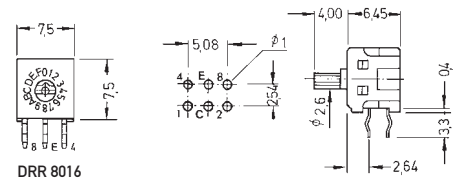
DRS 8010	BCD
DRS 8110	BCD Inverse
DRS 8016	Hexadecimal
DRS 8116	Hexadecimal Inverse

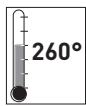


DRR 7010	BCD
DRR 7110	BCD Inverse
DRR 7016	Hexadecimal
DRR 7116	Hexadecimal Inverse



DRR 8010	BCD
DRR 8110	BCD Inverse
DRR 8016	Hexadecimal
DRR 8116	Hexadecimal Inverse





# Microminiature Rotary Coded Switches for SMT

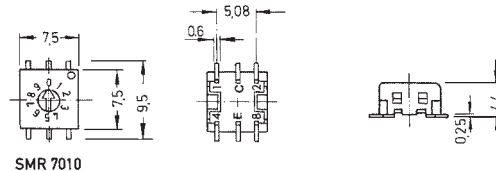
## Specifications:

Contact rating:	50 V DC, 100 mA, non-switching 15 V DC, 30 mA, switching
Contact resistance:	< 200 mΩ
Insulation resistance:	> 1000 MΩ at 250 V DC
Dielectric strength:	250 V, 50 Hz for the duration of 1 minute
Operating temperature:	-25° to +85° C
Mechanical life:	minimum 20 000 operations
Contacts:	gold-plated
Terminals:	phosphor bronze, gold-plated
Material:	case: PPS, black; frame: stainless steel rotor: PA, standard types yellow; inverse types red
Construction:	case totally sealed, suitable for washing by immersion
Mounting:	on pc-board – SMD

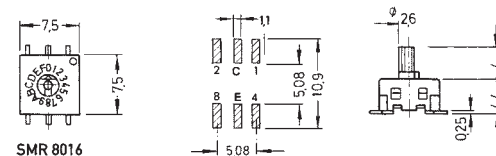
washable

## Models: Code

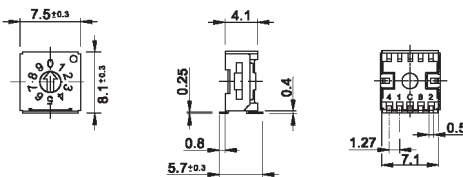
SMR 7010-1	BCD
SMR 7110-1	BCD Inverse
SMR 7016-1	Hexadecimal
SMR 7116-1	Hexadecimal Inverse



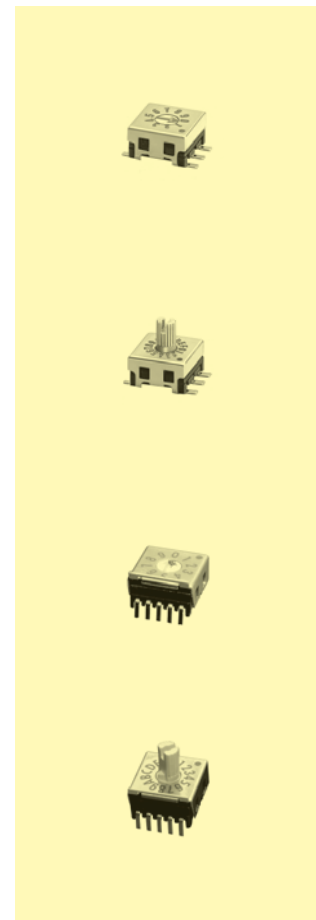
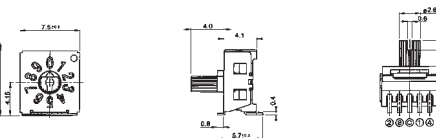
SMR 8010-1	BCD
SMR 8110-1	BCD Inverse
SMR 8016-1	Hexadecimal
SMR 8116-1	Hexadecimal Inverse



SMRR 7010-1	BCD
SMRR 7110-1	BCD Inverse
SMRR 7016-1	Hexadecimal
SMRR 7116-1	Hexadecimal Inverse

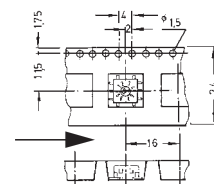


SMRR 8010-1	BCD
SMRR 8110-1	BCD Inverse
SMRR 8016-1	Hexadecimal
SMRR 8116-1	Hexadecimal Inverse



Packing:	sticks or tapes
	for order on tape: additional to type number: T
	example of order: SMR 7010-1 T

Models	Stick	Tape	Reel
SMR	50 pieces; L 450 mm	1000 pieces	∅ 330 mm
SMRR	50 pieces; L 435 mm	500 pieces	∅ 330 mm



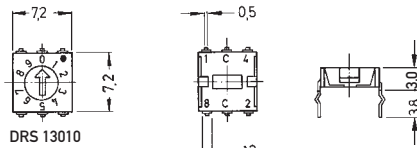
# Microminiature Rotary Coded Switches



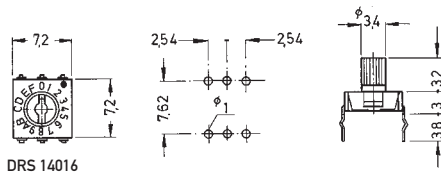
## Specifications:

Contact rating:	50 V DC, 100 mA, non-switching 5 V DC, 100 mA, switching
Contact resistance:	< 200 mΩ
Insulation resistance:	> 1000 MΩ
Dielectric strength:	250 V, 50 Hz for the duration of 1 minute
Operating temperature:	- 25° to + 75° C
Mechanical life:	minimum 10 000 operations
Contacts:	gold-plated
Terminals:	PC terminals, phosphor bronze, gold-plated
Case material:	thermoplastic; rotor: standard types ivory; inverse types red
Construction:	case totally sealed, suitable for washing by immersion
Mounting:	on pc-board
Soldering conditions:	auto-soldering – max.: 3 sec, 250° C

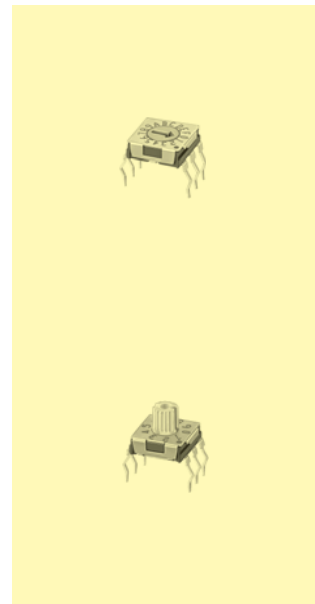
Models:	Code
DRS 13010	BCD
DRS 13110	BCD Inverse
DRS 13016	Hexadecimal
DRS 13116	Hexadecimal Inverse



DRS 14010	BCD
DRS 14110	BCD Inverse
DRS 14016	Hexadecimal
DRS 14116	Hexadecimal Inverse



washable





# Microminiature Rotary Coded Switches for SMT

## Specifications:

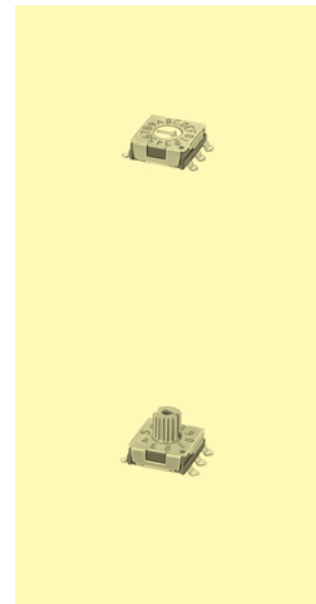
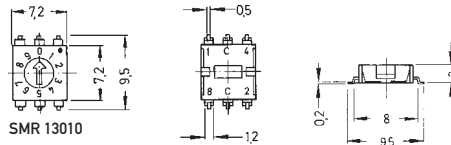
Contact rating:	50 V DC, 100 mA, non-switching 5 V DC, 100 mA, switching
Contact resistance:	< 200 mΩ
Insulation resistance:	> 1000 MΩ at 100 V DC
Dielectric strength:	250 V, 50 Hz for the duration of 1 minute
Operating temperature:	- 25° to + 75° C
Mechanical life:	minimum 20 000 operations
Contacts:	phosphor bronze, gold-plated
Material:	case: LCP; frame: stainless steel rotor: PA, standard types ivory; inverse types red
Construction:	case totally sealed, suitable for washing by immersion
Mounting:	on pc-board – SMD
Soldering conditions:	reflow-soldering – max.: 30 sec, 240° C

washable

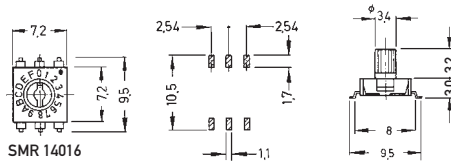
## Models:

Code

SMR 13010	BCD
SMR 13110	BCD Inverse
SMR 13016	Hexadecimal
SMR 13116	Hexadecimal Inverse



SMR 14010	BCD
SMR 14110	BCD Inverse
SMR 14016	Hexadecimal
SMR 14116	Hexadecimal Inverse



## Packing:

sticks or tapes

for order on tapes: additional to type number: T

example of order: SMR 13010 T

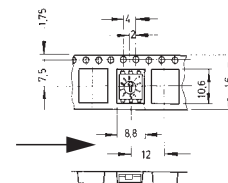
## Models

Stick

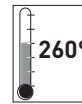
Tape

Reel

SMR 13 000	65 pieces; L 510 mm	2000 pieces	∅ 330 mm
SMR 14 000	65 pieces; L 510 mm	–	–



# Microminiature Rotary Coded Switches

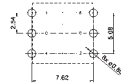
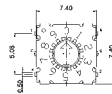


## Specifications:

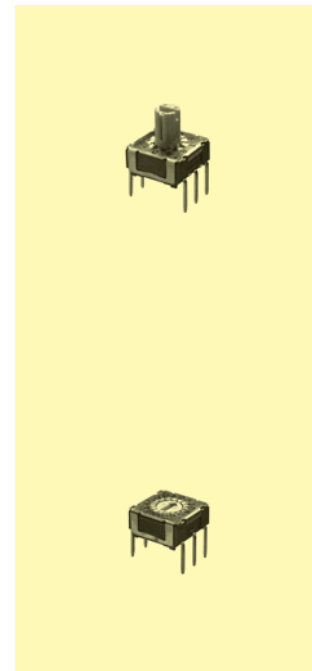
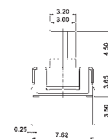
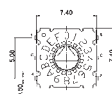
Contact rating:	42 V DC, 400 mA non-switching 42 V DC, 100 mA switching
Contact resistance:	< 80 mΩ
Insulation resistance:	>100 MΩ at 250 V DC for 1 minute ± 5 sec.
Dielectric strength:	250 V (50/60 Hz) for 1 minute
Operating temperature:	-50°C to +125°C
Storage temperature:	-55°C to +135°C
Mechanical life:	minimum 25 000 cycles
Material:	Cover/spring plate/guide plate: stainless steel Contact/terminal: phosphor bronze, >0,07 μm gold-plated over >0,3 μm nickel Rotor/base: PA66 O-ring: silicone
Actuator color:	BCD real: pink; BCD inverse: orange; Hex real: grey; Hex inverse: ivory
Protection:	IP67
Operating force:	120 ± 30 gf/cm
Soldering conditions:	auto-soldering – max.: 260° C ± 5°C, 5 ± 1sec., IR reflow soldering

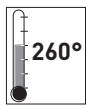
## Models: Code

DRS 15010	BCD
DRS 15110	BCD Inverse
DRS 15016	Hexadecimal
DRS 15116	Hexadecimal Inverse



DRS 16010	BCD
DRS 16110	BCD Inverse
DRS 16016	Hexadecimal
DRS 16116	Hexadecimal Inverse





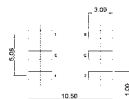
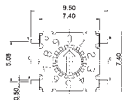
# Microminiature Rotary Coded Switches for SMT

## Specifications:

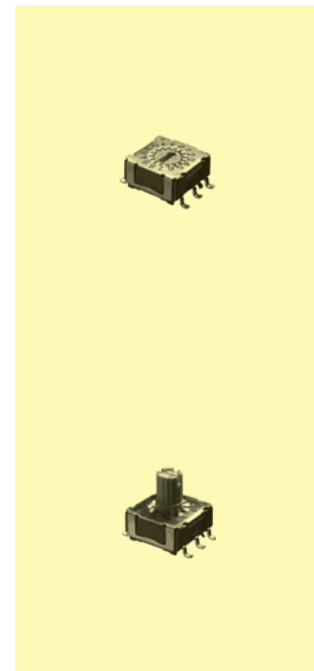
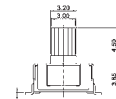
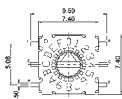
Contact rating:	42 V DC, 400 mA non-switching 42 V DC, 100 mA switching
Contact resistance:	< 80 mΩ
Insulation resistance:	>100 MΩ
Insulation resistance:	>100 MΩ at 250 V DC for 1 minute ± 5 sec.
Dielectric strength:	250 V (50/60 Hz) for 1 minute
Operating temperature:	-50°C to +125°C
Storage temperature:	-55°C to +135°C
Mechanical life:	minimum 25 000 cycles
Material:	Cover/spring plate/guide plate: stainless steel Contact/terminal: phosphor bronze, >0,07 μm gold-plated over >0,3 μm nickel Rotor/base: PA66 O-ring: silicone
Actuator color:	BCD real: pink; BCD inverse: orange; Hex real: grey; Hex inverse: ivory
Protection:	IP67
Operating force:	120 ± 30 gf/cm
Soldering conditions:	reflow soldering

## Models: Code

SMR 15010	BCD
SMR 15110	BCD Inverse
SMR 15016	Hexadecimal
SMR 15116	Hexadecimal Inverse



SMR 16010	BCD
SMR 16110	BCD Inverse
SMR 16016	Hexadecimal
SMR 16116	Hexadecimal Inverse



## Packing:

SMR 15	<input type="checkbox"/> <input type="checkbox"/>	1300 pieces/reel
SMR 16	<input type="checkbox"/> <input type="checkbox"/>	600 pieces/reel





## BCD

	0	1	2	3	4	5	6	7	8	9
8									X	X
4					X	X	X	X	X	
2			X	X		X	X	X		
1		X		X		X		X		X

## Hexadecimal

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
8									X	X	X	X	X	X	X	X
4					X	X	X	X			X	X	X	X	X	X
2			X	X		X	X				X	X				
1		X		X		X		X		X			X		X	

## BCD Inverse

	0	1	2	3	4	5	6	7	8	9
$\bar{8}$	X	X	X	X	X	X	X	X		
$\bar{4}$	X	X	X						X	X
$\bar{2}$	X	X		X	X			X	X	
$\bar{1}$	X		X		X		X		X	

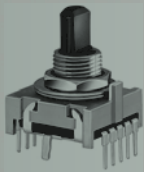
## Hexadecimal Inverse

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
$\bar{8}$	X	X	X	X	X	X	X	X								
$\bar{4}$	X	X	X						X	X	X	X				
$\bar{2}$	X	X		X	X			X	X		X	X		X	X	
$\bar{1}$	X		X		X		X		X		X		X		X	

# 7

## Rotary Switches

### 7.1 Miniature Rotary Switches



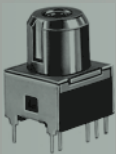
Series MR

164

Series MRS

165–168

### 7.2 Key Switches



Series MRK

169–170

### 7.3 Microminiature Rotary Switches



Series SMR

171

# Miniature Rotary Switches

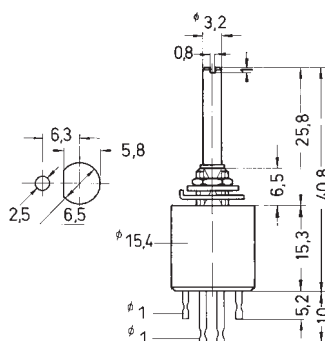
## Specifications:

Contact rating:	step angle between 2 positions 30°: 125 V AC, 0,15 24 V DC, 0,15 A
	step angle between 2 positions 36°: 125 V AC, 0,5 A 24 V DC, 0,5 A
Contact resistance:	< 10 mΩ
Insulation resistance:	> 100 MΩ at 500 V DC
Dielectric strength:	1000 V, 50 Hz for the duration of 1 minute
Humidity resistance:	10 MΩ after 48 h at 40° C and 95 % relative humidity
Operating temperature:	- 45° to + 110° C
Electrical life:	10 000 – 30 000 operations depending on load
Contacts:	coin silver
Material:	body: diallyl-phthalate, cover: aluminium shaft: brass, nickel-plated
Contact timing:	non-shorting
Mounting:	bushing 1/4" with locking plate or flat bush – 40 THD, key 8 mm axis 1/8"

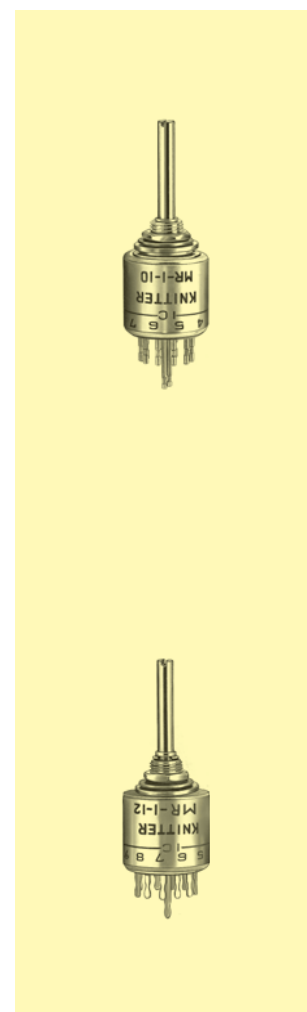
Models:	Poles	Positions
MR 1 – 10*	1	10
MR 1 – 10 C	1	10
MR 2 – 5*	2	5
MR 3 – 3*	3	3
MR 4 – 2	4	2

C = without stopper

\* On MR switches, the number of positions can be reduced by changing the positions of the inner ring. For using all positions, this ring has to be removed.



Angle between 2 positions 36°

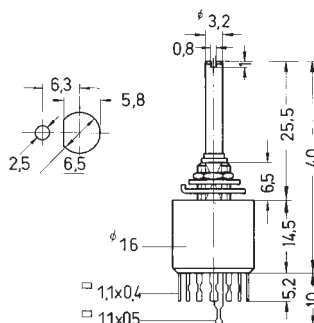


MR 1 – 12*	1	12
MR 2 – 6	2	6
MR 3 – 4	3	4
MR 4 – 3	4	3

\* without stopper

Switches are also available in a waterproof version (type **MRE**), shaft and bushing sealed by neoprene O-rings.

Water proofing:  
30 min. at 1 m water column.



Angle between 2 positions 30°



# Miniature Rotary Switches

## Specifications:

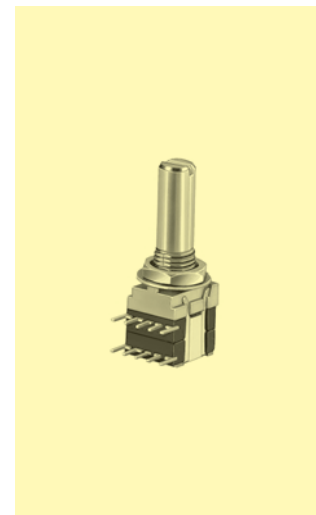
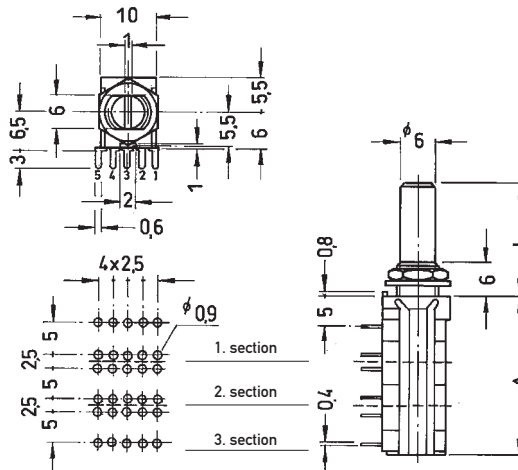
Contact rating:	16 V DC, 100 mA
Contact resistance:	< 50 mΩ
Insulation resistance:	> 100 MΩ at 500 V DC
Dielectric strength:	500 V, 50 Hz for the duration of 1 minute
Operating temperature:	- 20° to + 80° C
Mechanical life:	minimum 10 000 operations
Contacts:	gold
Material:	case: PBT with glass fibre 30%; shaft: PA or aluminium
Angle between 2 positions:	30°
Mounting:	on pc-board or front panel, bushing M 7 x 0,75, key 10 mm
Soldering conditions:	max.: 3 sec, 230° C ± 5° C

## Models:

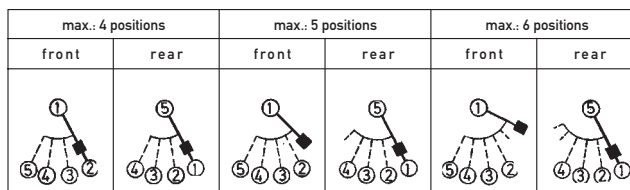
MRS 10 H

Measure A:

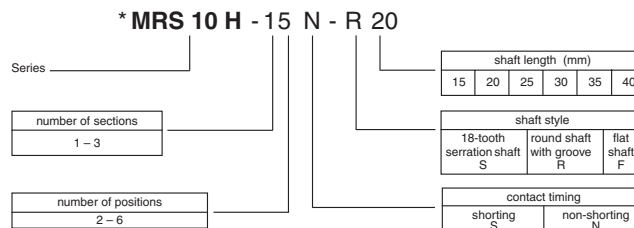
- 1 section 12,0 mm
- 2 sections 19,5 mm
- 3 sections 27,0 mm



## Circuit diagram:



## Ordering code:



\* Non-stock item; minimum quantity and delivery time on request.



# Miniature Rotary Switches

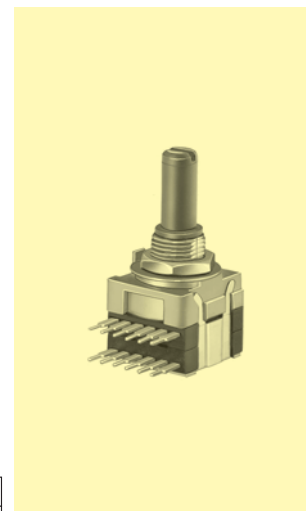
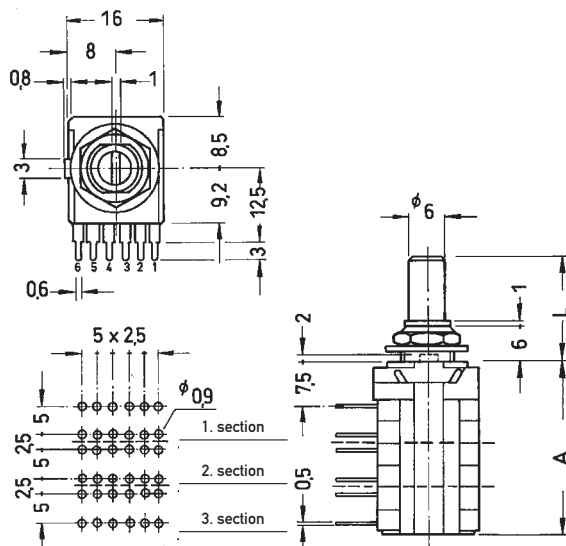
## Specifications:

Contact rating:	16 V DC, 300 mA
Contact resistance:	< 50 mΩ
Insulation resistance:	> 100 MΩ at 500 V DC
Dielectric strength:	500 V, 50 Hz for the duration of 1 minute
Operating temperature:	- 20° to + 80° C
Mechanical life:	minimum 10 000 operations
Contacts:	gold
Material:	case: PBT with glass fibre 30%; shaft: PA or aluminium
Angle between 2 positions:	30°
Mounting:	on pc-board or front panel, bushing M 9 x 0,75; key 12 mm;
Soldering conditions:	max.: 3 sec, 230° C ± 5° C

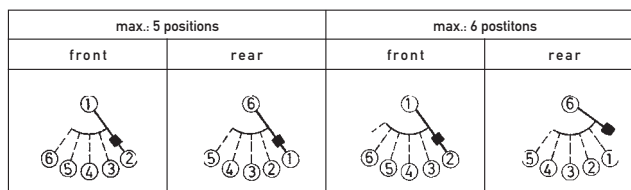
## Models:

MRS 16 H

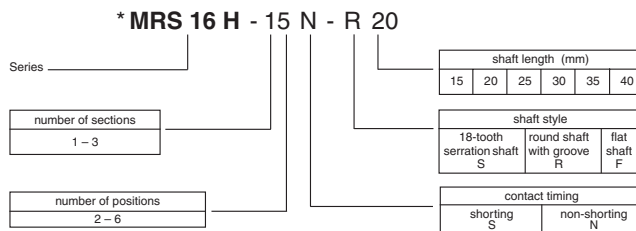
Measure A:  
 1 section 15,0 mm  
 2 sections 22,5 mm  
 3 sections 30,0 mm



## Circuit diagram:



## Ordering code:



\* Non-stock item; minimum quantity and delivery time on request.

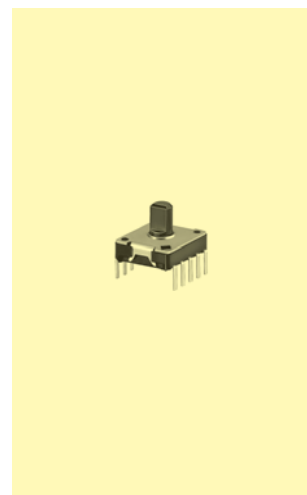
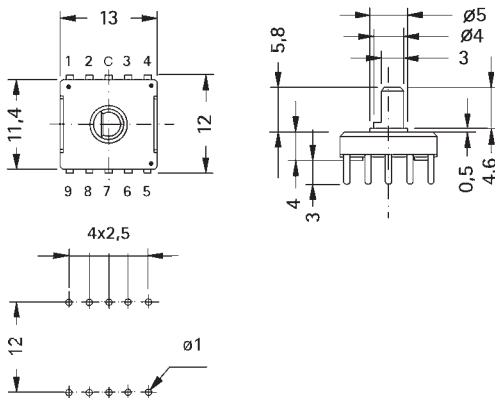


# Miniature Rotary Switches

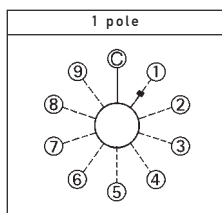
## Specifications:

Contact rating:	16 V DC, 100 mA
Contact resistance:	< 50 mΩ
Insulation resistance:	> 100 MΩ at 500 V DC
Dielectric strength:	100 V, 50 Hz for the duration of 1 minute
Operating temperature:	- 20° to + 80° C
Mechanical life:	minimum 10 000 operations
Contacts:	gold
Material:	case: PBT with glass fibre 30%; shaft: PA, flat
Angle between 2 positions:	40°, 9 positions
Mounting:	on pc-board
Contact timing:	non-shorting
Soldering conditions:	max.: 3 sec, 260° C
Operating force:	250 ± 100 gf. cm

<b>Models:</b>	Poles
MRS 12 V - 19	1



## Circuit diagram:



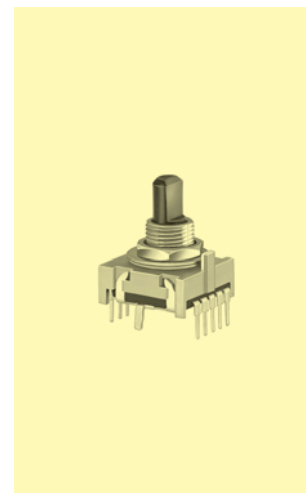
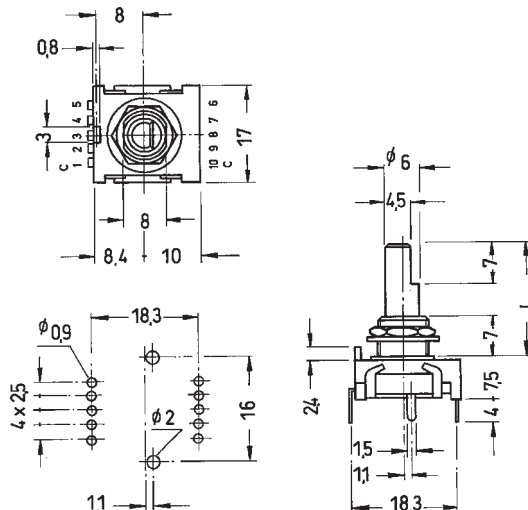
# Miniature Rotary Switches

## Specifications:

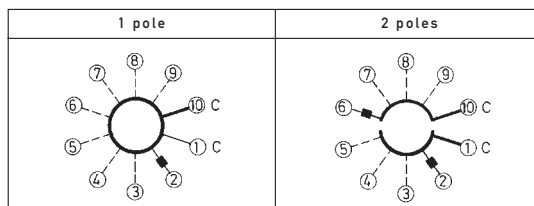
Contact rating:	16 V DC, 300 mA
Contact resistance:	< 50 mΩ
Insulation resistance:	> 100 MΩ at 500 V DC
Dielectric strength:	100 V, 50 Hz for the duration of 1 minute
Operating temperature:	- 20° to + 80° C
Mechanical life:	minimum 10 000 operations
Contacts:	gold
Material:	case: PBT with glass fibre 30%; shaft: PA or aluminium, flat
Angle between 2 positions:	30°
Mounting:	on pc-board or front panel, bushing M 9 x 0,75, key 12 mm
Contact timing:	non-shorting
Soldering conditions:	max.: 3 sec, 260° C

## Models:

MRS 18 V



## Circuit diagram:



## Ordering code:

\* MRS 18 V - 15 N - F 25 - 1

Series					
number of poles	1 - 2			shaft material	mold 1 metal 2
number of positions	2 - 8			shaft length (mm)	15 20 25
contact timing	shorting S non-shorting N			shaft style	18-tooth serration shaft S flat shaft F

\* Non-stock item; minimum quantity and delivery time on request

# Key Switches



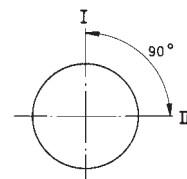
## Specifications:

Contact rating:	max. 20 V DC, 0,4 W
Contact resistance:	< 200 mΩ
Insulation resistance:	> 100 MΩ at 100 V DC
Dielectric strength:	250 V, 50 Hz for the duration of 1 minute
Operating temperature:	- 25° to + 70° C
Mechanical life:	minimum 10 000 operations
Contacts:	gold-plated
Terminals:	PC terminals, brass, silver-plated
Material:	case: PBT, black key: brass, nickel-plated; grip: plastic
Mounting:	on pc-board
Soldering conditions:	auto-soldering – max.: 3 sec, 245° C ± 10° C

Models:	Switching functions	Key positions		
		I	II	III
S P D T				
		O = Key removable X = Key not removable		

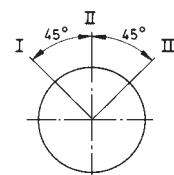
### Step angle 90°

MRK 1012 A	on	–	on	O	O
MRK 1012 B	on	–	on	O	X
MRK 1022 B	on	–	mom	O	X
MRK 1012 A – R	on	–	on	O	O
MRK 1012 B – R	on	–	on	O	X
MRK 1022 B – R	on	–	mom	O	X

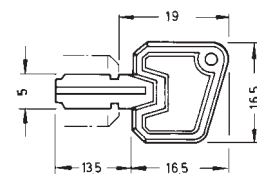


### Step angle 45°

MRK 1031 D	on	on	on	O	O	O
MRK 1031 L	on	on	on	X	O	X
MRK 1041 L	mom	on	mom	X	O	X
MRK 1031 D – R	on	on	on	O	O	O
MRK 1031 L – R	on	on	on	X	O	X
MRK 1041 L – R	mom	on	mom	X	O	X



2-pole switches and further key positions on request.



Switches are always supplied with 2 keys.

# Key Switches

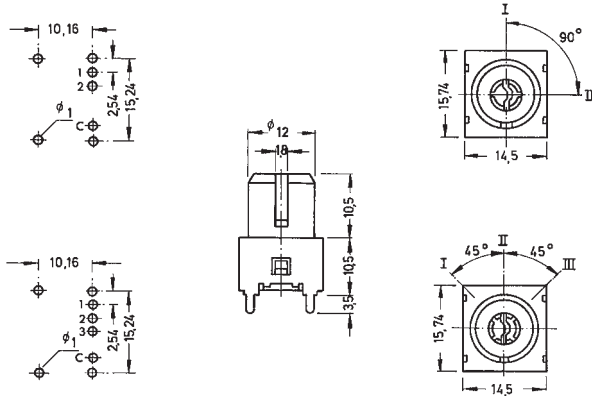


## Models:

### S P D T

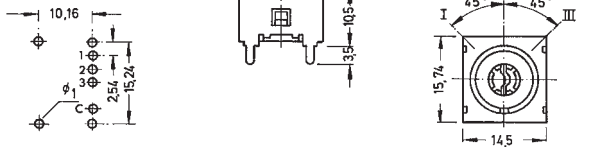
#### Step angle 90°

- MRK 1012 A
- MRK 1012 B
- MRK 1022 B



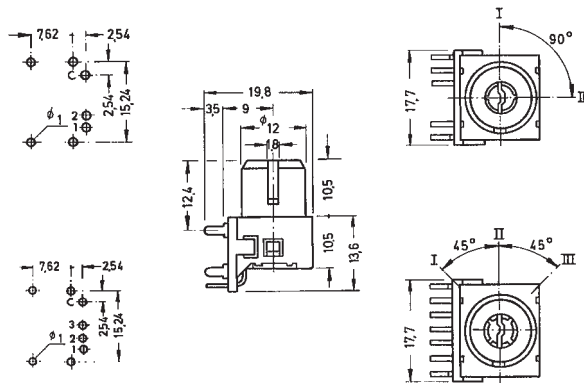
#### Step angle 45°

- MRK 1031 D
- MRK 1031 L
- MRK 1041 L



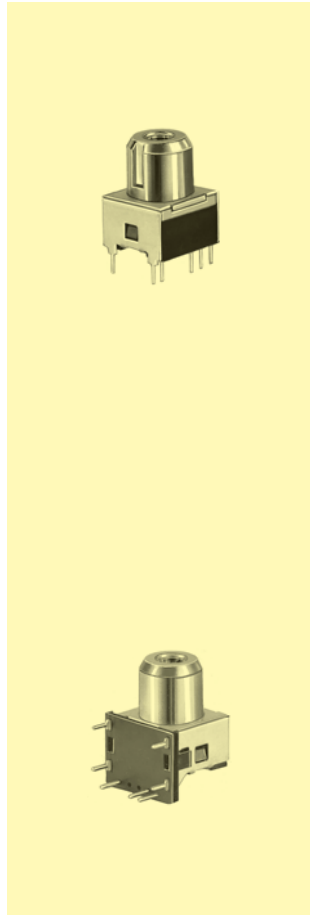
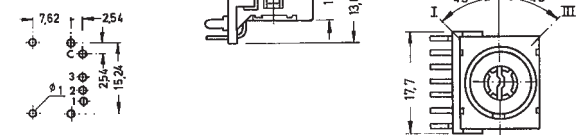
#### Step angle 90°

- MRK 1012 A – R
- MRK 1012 B – R
- MRK 1022 B – R



#### Step angle 45°

- MRK 1031 D – R
- MRK 1031 L – R
- MRK 1041 L – R

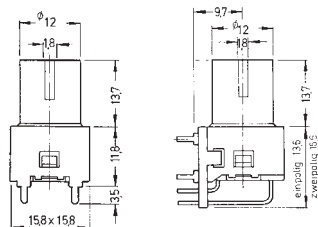


## 7

### Special versions:\*

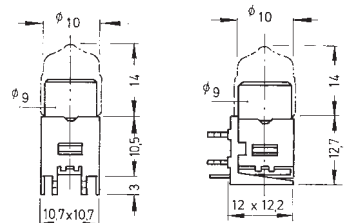
Key switch with security casing:

Type:  
MRKC



Key switch with plastic case and plastic key

Type:  
MRKS



\*Minimum quantity and delivery time on request



# Microminiature Rotary Switches for SMT

## Specifications:

Contact rating:	12 V DC, 50 mA min. 20 mV DC / 5 mA
Contact resistance:	< 100 mΩ
Insulation resistance:	> 50 000 MΩ
Dielectric strength:	500 V, 50 Hz for the duration of 1 minute
Operating temperature:	- 30° to + 85° C
Mechanical life:	minimum 800 operations
Contacts:	gold-plated over nickel barrier
Terminals:	gold-plated over nickel barrier
Material:	case: PPS thermoplastic meets UL 94 V-0, washable frame: stainless steel
Mounting:	on pc-board – SMD
Soldering conditions:	reflow-soldering – max.: 10 sec ±1 sec, 250° C ±10°

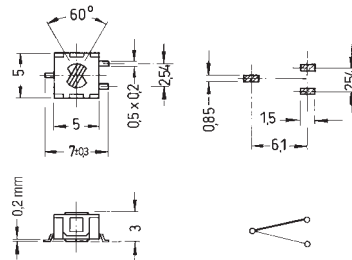
washable

## Models:

Switching functions

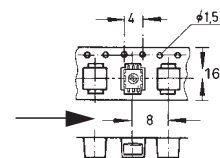
SMR 1–30

on – on



Packing:

on tapes: 2500 pieces; reel Ø 333 mm



# 8

## Encoder



MER 9 / MERP 9		174–175
MER 11 / MERP 11		176–178
MER 12 / MERP 12	illuminated	179–180
MRP		181

# Encoder

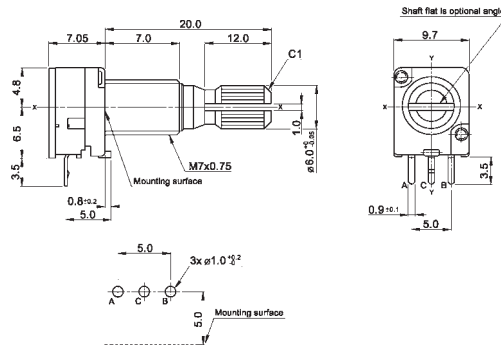


## Specifications:

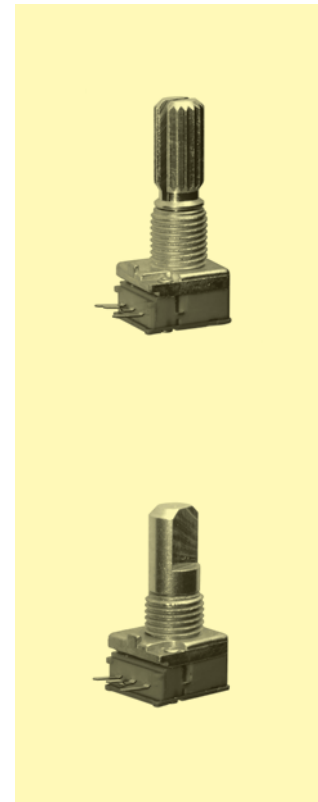
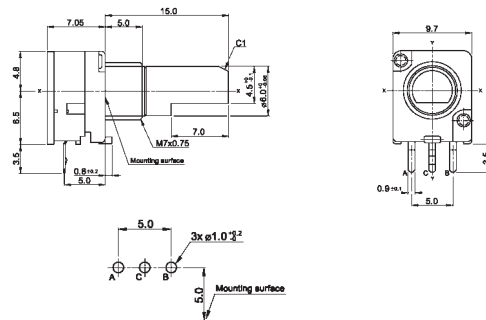
Contact rating:	5 V DC, 10 mA
Contact resistance:	< 100 mΩ
Insulation resistance:	> 100 MΩ
Dielectric strength:	300 V, 50 Hz for the duration of 1 minute
Operating temperature:	-10° to +65° C
Rotational/Detent torque:	0,5/1,0 Ncm
Pulses/Detents per turn:	15/30
Mechanical life:	> 15 000 cycles
Pushbutton (optional):	actuation force 5 N, travel 0,5 mm, life > 10 000 operations
Contacts:	silver-plated
Terminals:	silver-plated
Mounting:	on pc-board single hole mounting M 7 x 0,75
Soldering conditions:	auto-soldering – max.: 5 sec, 260° C

## Models:

MER9-15220BM7R

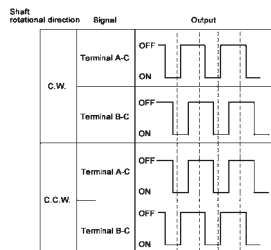


MER9-15115AM7R



8

## Output signal format:





# Encoder

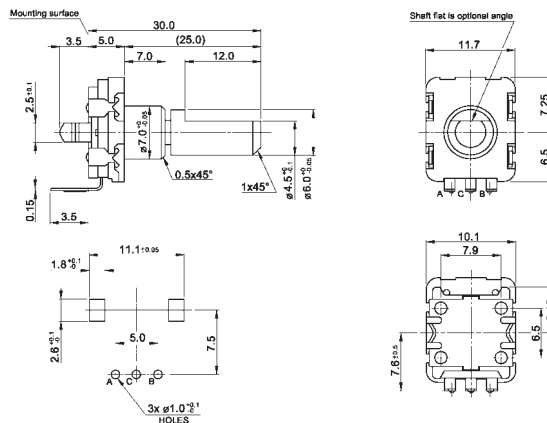


## Specifications:

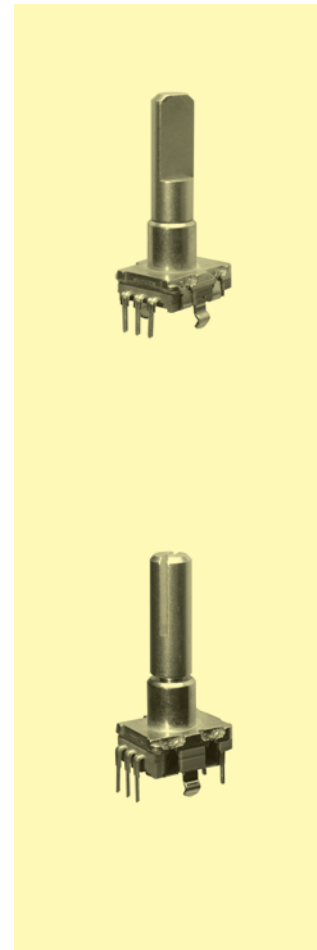
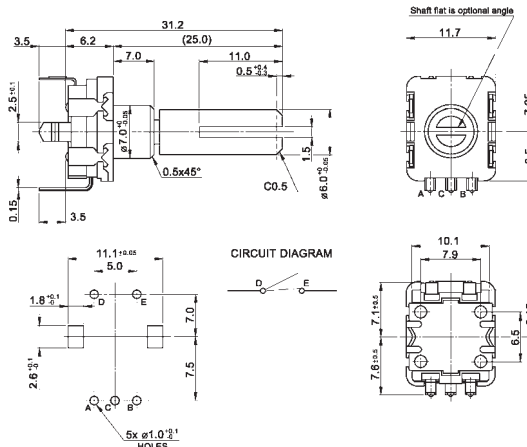
Contact rating:	5 V DC, 10 mA
Contact resistance:	< 100 mΩ
Insulation resistance:	> 100 MΩ
Dielectric strength:	300 V, 50 Hz for the duration of 1 minute
Operating temperature:	-10° to +85° C
Rotational/Detent torque:	0,5/1,2 Ncm
Pulses/Detents per turn:	15/30 or 20/20
Mechanical life:	> 15 000 cycles
Pushbutton (optional):	actuation force 6 N, travel 0,5 mm, life > 25 000 operations
Contacts:	silver-plated
Terminals:	silver-plated
Mounting:	on pc-board
	single hole mounting, bushing M 7 x 0,75
Soldering conditions:	auto-soldering – max.: 5 sec, 260° C

## Models:

MER11-15125B



MERP11-15325B

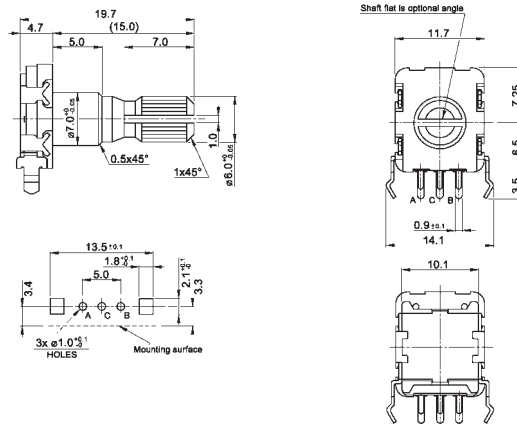




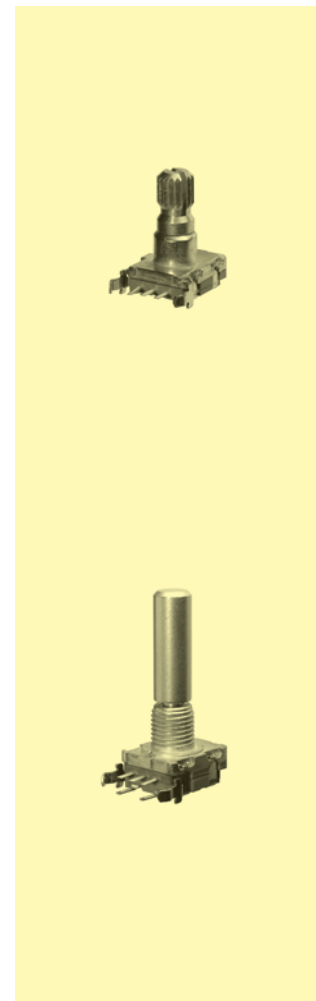
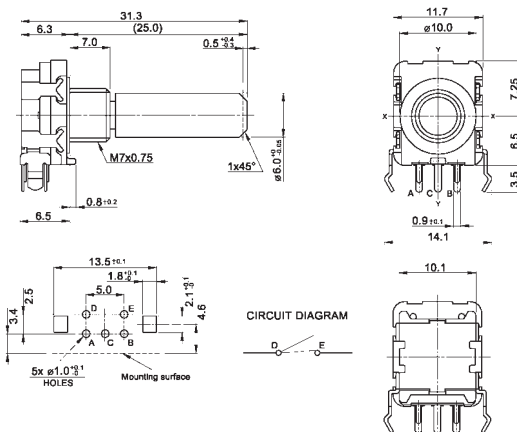
# Encoder

## Models:

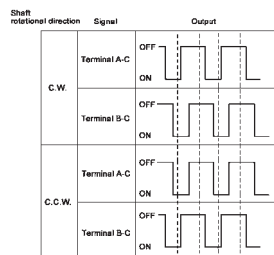
MER11-15215A-R



MERP11-2042BM7-R



## Output signal format:



## Ordering code 11 mm Encoder:

MER     11      -

**Switch function:**  
 No switch  
 Switch

**PCB mounting**  
 Through hole  
 SMD

**Shaft type:**  
 1 Flat shaft  
 2 Knurled shaft  
 3 Cut shaft  
 4 Round shaft

**Bushing:**  
 A 5 mm  
 B 7 mm

**Orientation:**  
 Horizontal  
 Vertical

**Number of pulses:**  
 15 15 Pulses  
 20 20 Pulses

**Shaft Length:**  
 15 15 mm  
 20 20 mm  
 25 25 mm

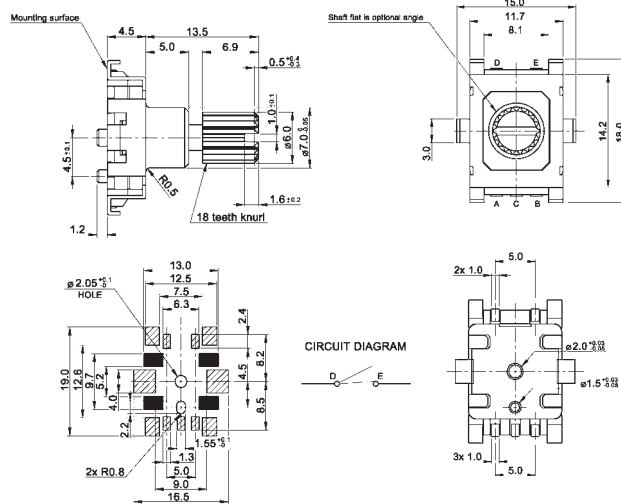
**Bushing thread:**  
 M7  
 No thread

## Specifications:

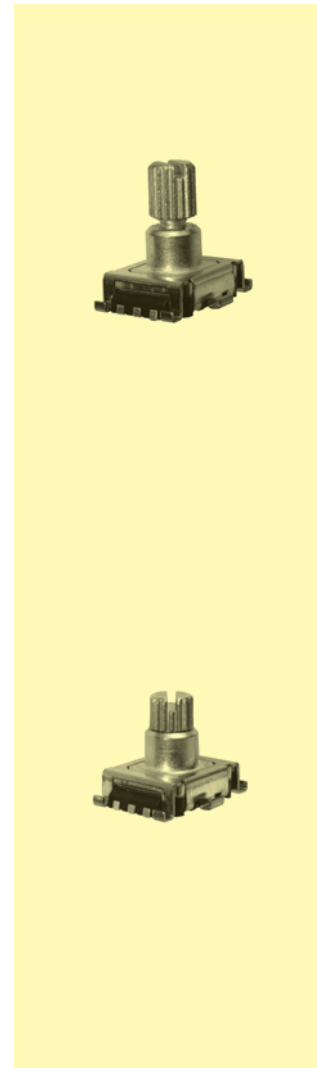
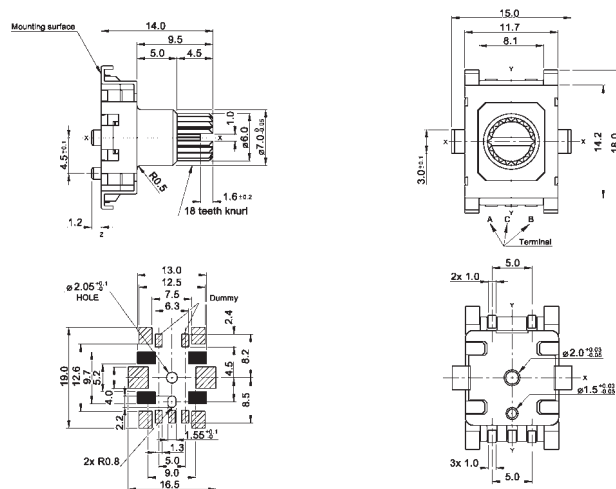
Contact rating:	5 V DC 10 mA
Contact resistance:	< 100 mΩ
Insulation resistance:	> 100 MΩ
Dielectric strength:	300 V, 50 Hz for the duration of 1 minute
Operating temperature:	-40° to +85° C
Rotational/Detent torque:	0,5/1,0 Ncm
Pulses/Detents per turn:	15/30 or 20/20
Mechanical life:	> 15 000 cycles
Pushbutton (optional):	actuation force 4 N, travel 0,5 mm, life > 25 000 operations
Contacts:	silver-plated
Terminals:	silver-plated
Mounting:	on pc-board – SMD

## Models:

MERPS11-15213



MERS11-15295



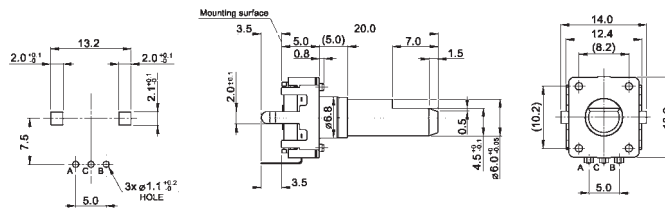


## Specifications:

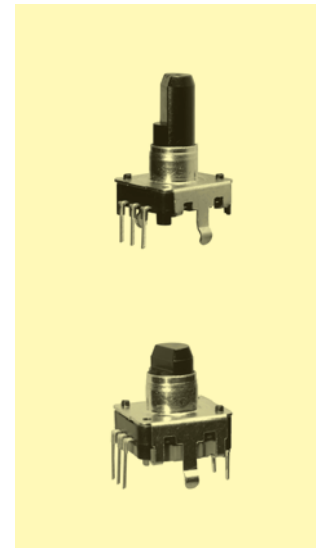
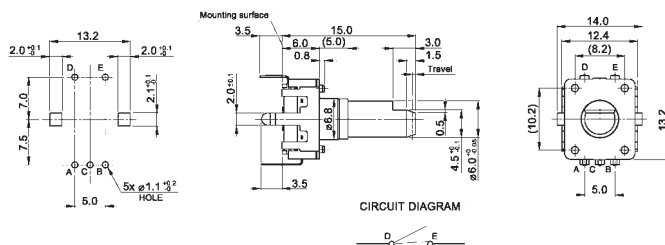
Contact rating:	5 V DC, 10 mA
Contact resistance:	< 100 mΩ
Insulation resistance:	> 100 MΩ
Dielectric strength:	300 V, 50 Hz for the duration of 1 minute
Operating temperature:	-40° to +85° C
Rotational/Detent torque:	0,5 N/2,0 Ncm
Pulses/Detents per turn:	24/24
Mechanical life:	> 30 000 cycles
Pushbutton (optional):	actuation force 3 N, travel 0,5 mm, life > 20 000 operations
Contacts:	silver-plated
Terminals:	silver plated
Mounting:	on pc-board
Soldering conditions:	single hole mounting, bushing M 9 x 0,75 auto-soldering – max.: 5 sec, 260° C

## Models:

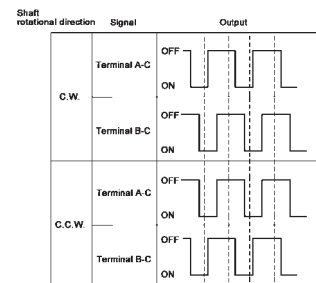
MER12-24120



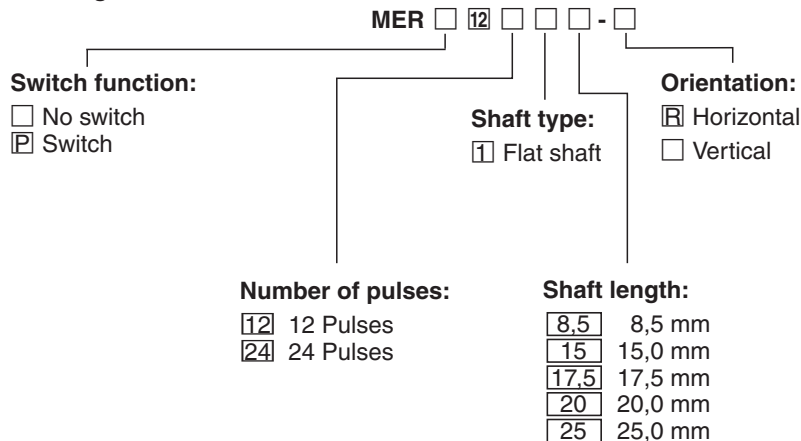
MERP12-24115



## Output signal format:



## Ordering code 12 mm Encoder:







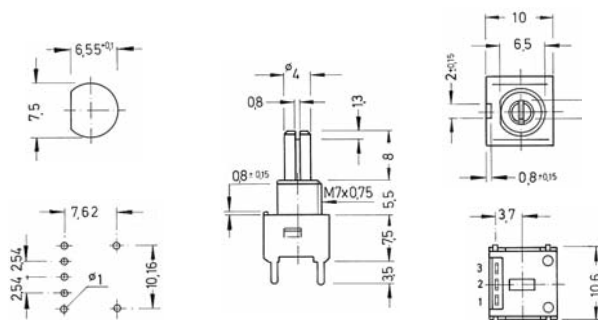
# Encoder

## Specifications:

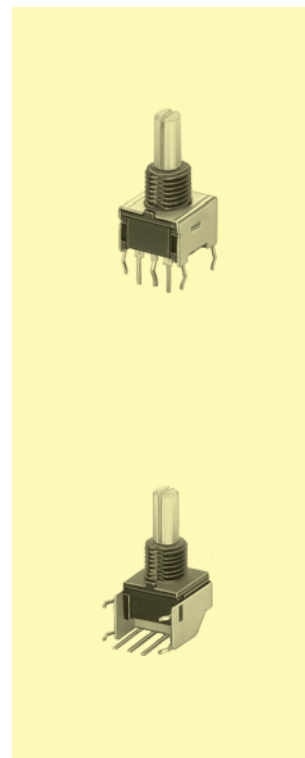
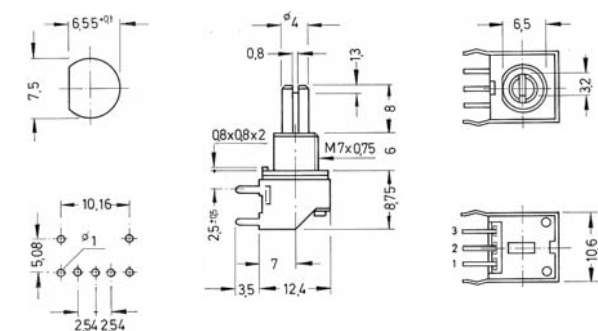
Contact rating:	5 V DC, 10 mA
Contact resistance:	< 100 mΩ
Insulation resistance:	> 100 MΩ
Dielectric strength:	250 V, 50 Hz for the duration of 1 minute
Operating temperature:	- 25° to + 70° C
Mechanical life:	minimum 10 000 operations
Contacts:	phosphor bronze, gold-plated
Terminals:	PC terminals
Material:	case: PBT black; frame: steel, tin-plated; rotor: PA
Mounting:	on pc-board or single hole mounting, bushing M 7 x 0,75, key 11 mm
Soldering conditions:	auto-soldering – max.: 5 sec, 250° C ± 5° C

## Models:

MRP 1 – 20



MRP 1 – 20 – R



Mounting set for single hole mounting

1 nut M 7 x 0,75, key 11 mm

1 washer Ø 12 mm

Order number

RR 775

Circuit diagram – 20 pulses/circle ± 2 pulses

Contact between pulse	Angle
2-1 on	0
2-1 off	18°
2-3 on	36°
2-3 off	324°
	342°
	360°