



## TECHNICAL MANUAL

Rotary switches  
PV and PP EKF

## 1 DESCRIPTION

Rotary switches are designed for 50/60/400 Hz AC electrical circuits with voltage up to 400V and DC electrical circuits up to 220V to be used as:

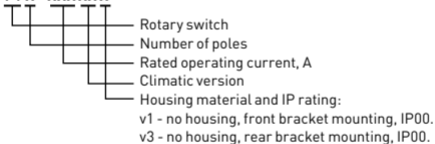
- lead-in circuit breakers and switches in control circuits of power distribution systems;
- manually operated switching devices for infrequent close/open operations;
- manual control of asynchronous electric motors in AC electric circuits.

Switches enable operation in the following modes: continuous, intermittent-continuous and intermittent-periodic. Switching rate does not exceed 120 operations per hour.

Rotary switches comply with IEC 60947-5-1:2016.

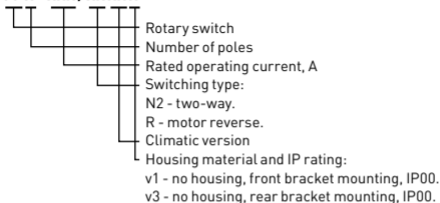
### TYPE CODE

#### **PV X - XXX XXX**



E.g.: PV 1-16 M3 v.3 EKF

## PP X - XXX / XXXX X

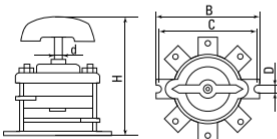


E.g.: PP 2-40/N2 M3 v1 EKF

## 2 TECHNICAL DATA

2.1 For PV technical specifications, refer to figures and tables below.

### Rotary switches PV - version 3



- No housing;
- Degree of protection: IP00;
- Mounting with rear bracket.

Fig. 1

Table 1

Name	Rated operating current In (A) and voltage Ue (V)	Wiring diagram	Overall and installation dimensions, mm				
			C	B	H	D	d
PV 1-16 M3 v3	16A 220V (DC) 16A 230V (AC) 10A 400V (AC)	Fig. 10	56	60	70	5	6
PV 2-16 M3 v3		Fig. 11	56	60	75	5	6
PV 3-16 M3 v3		Fig. 12	56	60	80	5	6
PV 4-16 M3 v3		Fig. 13	56	60	85	5	6
PV 2-40 M3 v3	40A 220V (DC) 40A 230V (AC) 25A 400V (AC)	Fig. 11	90	100	100	6	8
PV 3-40 M3 v3		Fig. 12	90	100	115	6	8
PV 4-40 M3 v3		Fig. 13	90	100	120	6	8
PV 2-63 M3 v3	63A 220V (DC) 63A 230V (AC) 40A 400V (AC)	Fig. 11	90	100	120	6	8
PV 3-63 M3 v3		Fig. 12	90	100	145	6	8
PV 2-100 M3 v3	100A 220V (DC) 100A 230V (AC) 60A 400V (AC)	Fig. 11	130	140	130	7	9
PV 3-100 M3 v3		Fig. 12	130	140	150	7	9
PV 4-100 M3 v3		Fig. 13	130	140	160	7	9

### Rotary switches PV - version 1

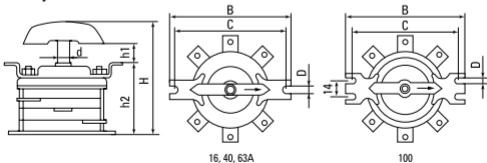


Fig. 2

- No housing;
- Degree of protection: IP00;
- Mounting with front bracket.

Table 2

Name	Rated operating current $I_n$ (A) and voltage $U_e$ (V)	Wiring diagram	Overall and installation dimensions, mm						
			C	B	H	h1	h2	D	d
PV 1-16 M3 v1	16A 220V (DC) 16A 230V (AC) 10A 400V (AC)	Fig. 10	77	90	70	10	40	5	6
PV 2-16 M3 v1		Fig. 11	77	90	75	14	40	5	6
PV 3-16 M3 v1		Fig. 12	77	90	80	14	55	5	6
PV 4-16 M3 v1		Fig. 13	77	90	85	14	55	5	6
PV 2-40 M3 v1	40A 220V (DC) 40A 230V (AC) 25A 400V (AC)	Fig. 11	105	120	100	20	60	6	8
PV 3-40 M3 v1		Fig. 12	105	120	115	20	70	6	8
PV 4-40 M3 v1		Fig. 13	105	120	120	20	80	6	8
PV 2-63 M3 v1	63A 220V (DC) 63A 230V (AC) 40A 400V (AC)	Fig. 11	105	120	120	20	80	6	8
PV 3-63 M3 v1		Fig. 12	105	120	145	20	100	6	8
PV 2-100 M3 v1	100A 220V (DC) 100A 230V (AC) 60A 400V (AC)	Fig. 11	138	155	130	25	80	7	9
PV 3-100 M3 v1		Fig. 12	138	155	150	25	90	7	9
PV 4-100 M3 v1		Fig. 13	138	155	160	25	107	7	9

## Rotary switches PV - carbolite housing

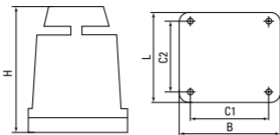


Fig. 3

- Carbolite protective housing;
- Degree of protection: IP30;
- Mounting with housing base.

Table 3

Name	Rated operating current In (A) and voltage Ue (V)	Wiring diagram	Overall and installation dimensions, mm				
			C1	C2	L	H	B
PV 2-16 M3 carbolite IP30	16A 220V (DC) 16A 230V (AC)	Fig. 11	65	65	77	90	77
PV 3-16 M3 carbolite IP30	10A 400V (AC)	Fig. 12	65	65	77	90	77

## Rotary switches PV - plastic housing

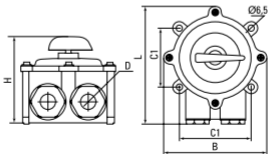


Fig. 4

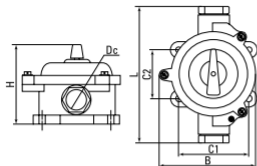
- High-impact flame retardant plastic housing;
- Degree of protection: IP56;
- Mounting with housing base.

Glands' connection: 

Table 4

Name	Rated operating current In (A) and voltage Ue (V)	Wiring diagram	Overall and installation dimensions, mm						Glands' connection
			C1	C2	L	H	B	Dc	
PV 1-16 M1 plastic IP56	16A 220V (DC) 16A 230V (AC) 10A 400V (AC)	Fig. 10	80	60	115	85	100	15	3
PV 2-16 M1 plastic IP56		Fig. 11	80	60	115	85	100	15	3
PV 3-16 M1 plastic IP56		Fig. 12	80	60	115	85	100	15	3
PV 4-16 M1 plastic IP56		Fig. 13	80	60	115	90	100	15	2
PV 2-40 M1 plastic IP56	40A 220V (DC) 40A 230V (AC) 25A 400V (AC)	Fig. 11	100	100	165	130	140	20	3
PV 3-40 M1 plastic IP56		Fig. 12	100	100	165	130	140	20	3
PV 4-40 M1 plastic IP56		Fig. 13	100	100	185	135	140	20	2
PV 2-63 M1 plastic IP56	63A 220V (DC) 63A 230V (AC) 40A 400V (AC)	Fig. 11	100	100	185	135	140	20	2
PV 2-100 M1 plastic IP56	100A 220V (DC) 100A 230V (AC) 60A 400V (AC)	Fig. 11	125	125	215	155	192	30	3
PV 3-100 M1 plastic IP56		Fig. 12	125	125	215	165	192	30	3

## Rotary switches PV - silumin housing



- Silumin protective housing;
- Degree of protection: IP56;
- Mounting with housing base.

Glands' connection: 

Fig. 5

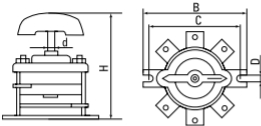
Table 5

Name	Rated operating current In (A) and voltage Ue (V)	Wiring diagram	Overall and installation dimensions, mm						Glands' connection
			C1	C2	L	H	B	Dc	
PV 2-16 M1 silumin IP56	16A 220V (DC) 16A 230V (AC) 10A 400V (AC)	Fig. 11	80	60	150	100	100	20	1
PV 3-16 M1 silumin IP56		Fig. 12	80	60	150	100	100	20	1
PV 2-40 M1 silumin IP56	40A 220V (DC) 40A 230V (AC) 25A 400V (AC)	Fig. 11	100	100	200	140	145	25	1
PV 3-40 M1 silumin IP56		Fig. 12	100	100	200	150	145	25	1
PV 2-63 M1 silumin IP56	63A 220V (DC) 63A 230V (AC) 40A 400V (AC)	Fig. 11	100	100	185	150	145	25	2
PV 3-63 M1 silumin IP56		Fig. 12	100	100	185	180	145	25	2
PV 2-100 M1 silumin IP56	100A 220V (DC) 100A 230V (AC) 60A 400V (AC)	Fig. 11	130	130	240	180	170	35	2
PV 3-100 M1 silumin IP56		Fig. 12	130	130	240	185	170	35	2



2.2 For PP technical specifications, refer to figures and tables below.

### Rotary switches PP - version 3



- No housing;
- Degree of protection: IP00;
- Mounting with rear bracket.

Fig. 6

Table 6

Name	Rated operating current $I_n$ (A) and voltage $U_e$ (V)	Wiring diagram	Overall and installation dimensions, mm				
			C	B	H	D	d
PP 1-16/N2 M3 v3	16A 220V (DC) 16A 230V (AC) 10A 400V (AC)	Fig. 14	56	60	70	5	6
PP 2-16/N2 M3 v3		Fig. 15	56	60	75	5	6
PP 3-16/N2 M3 v3		Fig. 16	56	60	80	5	6
PP 4-16/N2 M3 v3		Fig. 17	56	60	85	5	6
PP 3-16/R M3 v3		Fig. 18	56	60	80	5	6
PP 2-40/N2 M3 v3	40A 220V (DC) 40A 230V (AC) 25A 400V (AC)	Fig. 15	90	100	100	6	8
PP 3-40/N2 M3 v3		Fig. 16	90	100	115	6	8
PP 4-40/N2 M3 v3		Fig. 17	90	100	120	6	8
PP 3-40/R M3 v3		Fig. 18	90	100	100	6	8
PP 2-63/N2 M3 v3	63A 220V (DC) 63A 230V (AC) 40A 400V (AC)	Fig. 15	90	100	120	6	8
PP 3-63/N2 M3 v3		Fig. 16	90	100	145	6	8
PP 2-100/N2 M3 v3	100A 220V (DC) 100A 230V (AC) 60A 400V (AC)	Fig. 15	130	140	130	7	9
PP 3-100/N2 M3 v3		Fig. 16	130	140	150	7	9
PP 4-100/N2 M3 v3		Fig. 17	130	140	160	7	9
PP 3-100/R M3 v3		Fig. 18	130	140	150	7	9

## Rotary switches PP - version 1

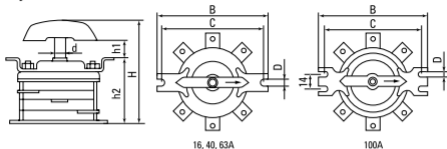


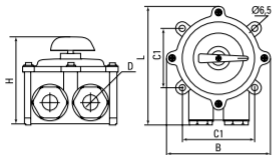
Fig. 7

- No housing;
- Degree of protection: IP00;
- Mounting with front bracket.

Table 7

Name	Rated operating current $I_n$ (A) and voltage $U_e$ (V)	Wiring diagram	Overall and installation dimensions, mm						
			C	B	H	$h_1$	$h_2$	D	d
PP 1-16/N2 M3 v1	16A 220V (DC) 16A 230V (AC) 10A 400V (AC)	Fig. 14	77	90	70	10	40	5	6
PP 2-16/N2 M3 v1		Fig. 15	77	90	75	14	40	5	6
PP 3-16/N2 M3 v1		Fig. 16	77	90	80	14	55	5	6
PP 4-16/N2 M3 v1		Fig. 17	77	90	85	14	55	5	6
PP 3-16/R M3 v1		Fig. 18	77	90	80	14	55	5	6
PP 2-40/N2 M3 v1	40A 220V (DC) 40A 230V (AC) 25A 400V (AC)	Fig. 15	105	120	100	20	60	6	8
PP 3-40/N2 M3 v1		Fig. 16	105	120	115	20	70	6	8
PP 4-40/N2 M3 v1		Fig. 17	105	120	120	20	80	6	8
PP 3-40/R M3 v1		Fig. 18	105	120	100	20	60	6	8
PP 2-63/N2 M3 v1	63A 220V (DC) 63A 230V (AC) 40A 400V (AC)	Fig. 15	105	120	120	20	80	6	8
PP 3-63/N2 M3 v1		Fig. 16	105	120	145	20	100	6	8
PP 2-100/N2 M3 v1	100A 220V (DC) 100A 230V (AC) 60A 400V (AC)	Fig. 15	138	155	130	25	80	7	9
PP 3-100/N2 M3 v1		Fig. 16	138	155	150	25	90	7	9
PP 4-100/N2 M3 v1		Fig. 17	138	155	160	25	107	7	9
PP 3-100/R M3 v1		Fig. 18	138	155	150	25	90	7	9

## Rotary switches PP - plastic housing



- High-impact flame-retardant plastic housing;
- Degree of protection: IP56;
- Mounting with housing base.

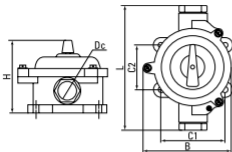
Fig. 8

Glands' connection: 

Table 8

Name	Rated operating current I <sub>n</sub> (A) and voltage U <sub>e</sub> (V)	Wiring diagram	Overall and installation dimensions, mm						Glands' connecton
			C1	C2	L	H	B	Dc	
PP 2-16/N2 M2 plastic IP56	16A 220V (DC)	Fig. 15	80	60	115	85	100	15	3
PP 3-16/N2 M2 plastic IP56	16A 230V (AC)	Fig. 16	80	60	115	85	100	15	3
PP 4-16/N2 M2 plastic IP56	10A 400V (AC)	Fig. 17	80	60	115	90	100	15	3
PP 3-16/N2 M2 plastic IP56	10A 400V (AC)	Fig. 18	80	60	115	90	100	15	3
PP 2-40/N2 M2 plastic IP56	40A 220V (DC)	Fig. 15	100	100	165	130	140	20	3
PP 3-40/N2 M2 plastic IP56	40A 230V (AC)	Fig. 16	100	100	165	130	140	20	3
PP 4-40/N2 M2 plastic IP56	25A 400V (AC)	Fig. 17	100	100	185	135	140	20	2
PP 3-40/R M2 plastic IP56	25A 400V (AC)	Fig. 18	100	100	165	130	140	20	3
PP 2-63/N2 M2 plastic IP56	63A 220V (DC) 63A 230V (AC) 40A 400V (AC)	Fig. 15	100	100	185	135	140	20	2
PP 2-100/N2 M2 plastic IP56	100A 220V (DC)	Fig. 15	125	125	215	155	192	30	3
PP 3-100/N2 M2 plastic IP56	100A 230V (AC)	Fig. 16	125	125	215	165	192	30	3
PP 3-100/R M2 plastic IP56	60A 400V (AC)	Fig. 18	125	125	215	165	192	30	3

## Rotary switches PP - silumin housing



- Silumin protective housing;
- Degree of protection: IP56;
- Mounting with housing base.

Fig. 9

Glands' connection: 

Table 9

Name	Rated operating current $I_n$ (A) and voltage $U_e$ (V)	Wiring diagram	Overall and installation dimensions, mm						Glands' connection
			C1	C2	L	H	B	Dc	
PP 2-16/N2 M2 silumin IP56	16A 220V (DC) 16A 230V (AC)	Fig. 15	80	60	150	100	100	20	1
PP 3-16/N2 M2 silumin IP56	10A 400V (AC)	Fig. 16	80	60	150	100	100	20	1
PP 2-40/N2 M2 silumin IP56	40A 220V (DC) 40A 230V (AC)	Fig. 15	100	100	200	140	145	25	1
PP 3-40/N2 M2 silumin IP56	25A 400V (AC)	Fig. 16	100	100	200	150	145	25	1
PP 2-63/N2 M2 silumin IP56	63A 220V (DC) 63A 230V (AC)	Fig. 15	100	100	185	150	145	25	2
PP 3-63/N2 M2 silumin IP56	40A 400V (AC)	Fig. 16	100	100	185	180	145	25	2
PP 2-100/N2 M2 silumin IP56	100A 220V (DC) 100A 230V (AC)	Fig. 15	130	130	240	180	170	35	2
PP 3-100/N2 M2 silumin IP56	60A 400V (AC)	Fig. 16	130	130	240	185	170	35	2

For wiring diagrams, refer to figures 10-18.

Rotary switches PV

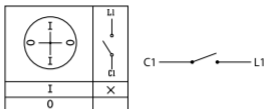


Fig. 10 - 1-pole rotary switch

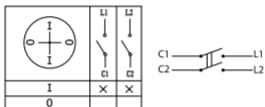


Fig. 11 - 2-pole rotary switch

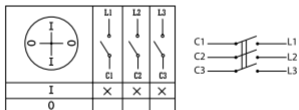


Fig. 12 - 3-pole rotary switch

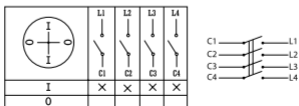


Fig. 13 - 4-pole rotary switch

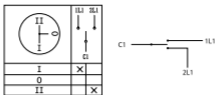


Fig. 14 - 1-pole 2-position rotary switch

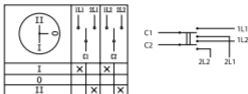


Fig. 15 - 2-pole 2-position rotary switch

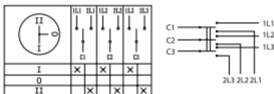


Fig. 16 - 3-pole 2-position rotary switch



Fig. 17 - 4-pole 2-position rotary switch

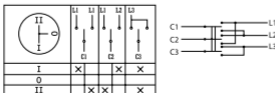


Fig. 18 - 3-pole reverse rotary switch

Table 10 - Utilization categories

Rated current, A	Rated voltage, V	Utilization category	Rated switching mode		
			Close, A	Open, A	Electrical endurance, 0-C cycles
16	230	AC-3	36	6	15 000
40			96	16	5000
63			150	25	5000
100			240	40	5000
16	400		24	4	15 000
40			54	9	5000
63			96	16	5000
100			150	25	5000
16	230	AC-4	15	15	5000
63			96	96	1000
16	400		12	12	5000
63			60	60	1000
16	230	AC-20	-	-	15 000
40			-	-	15 000
63			-	-	10 000
100			-	-	10 000
16	400		-	-	15 000
40			-	-	15 000
63			-	-	10 000
100			-	-	10 000
16	230	AC-21	16	16	15 000
40			40	40	15 000
63			63	63	10 000
100			100	100	10 000
16	400		10	10	15 000
40			25	25	15 000
63			40	40	10 000
100			63	63	10 000
16	230	AC-22	16	16	15 000
40			40	40	15 000

Table 10 continued

Rated current, A	Rated voltage, V	Utilization category	Rated switching mode		
			Close, A	Open, A	Electrical endurance, O-C cycles
63	230	AC-22	63	63	10 000
100			100	10 000	
16	400		10	10	15 000
40			25	25	15 000
63			40	40	10 000
100			63	63	10 000
16	230	AC-23	10	10	15 000
40			25	25	5000
63			38	38	5000
100			60	60	5000
16	400		6	6	15 000
40			16	16	5000
63		24	24	5000	
100		38	38	5000	
16	220	DC-4	15	6	5000
40			40	16	7500
63			63	25	5000
100			100	40	5000
63	220	DC-5	63	63	5000
16	220	DC-20	-	-	15 000
40			-	-	15 000
63			-	-	10 000
100			-	-	10 000
16	220	DC-21	16	16	15 000
40			40	40	15 000
63			63	63	10 000
100			100	100	10 000
16	220	DC-22	7	7	5000
40			16	16	7500
63			25	25	5000
100			40	40	5000



### 3 INSTALLATION AND OPERATION

#### 1. Version with no housing

Rotary switches shall be installed in dust-free rooms with no risk of accidental contact with the fixed contacts.

Before installation, wipe the switches with a clean dry cloth to remove protective grease from metal surfaces and dust from insulating parts.

Wire ends connected to 16-40A devices without end terminals shall be soldered.

For 63-100A devices with lugs, insert soldered wire ends into the lug, crimp and solder together with the lug.

#### 2. Version with protective housing

Rotary switches PV with protective housing are secured by plastic casing to protect the device against foreign objects ingress and accidental contact with live parts.

#### 3. Version with watertight housing

Rotary switches with watertight housing are encapsulated with plastic or aluminium casing to prevent water ingress. Watertight housing is available for all sizes.

Before installation, wipe switches with a dry cloth.

Follow Table 11 to connect copper and aluminium wires to the device terminals.

Table 11

Rated current, A	Cross-section of connected wires, mm <sup>2</sup>		Connection type
	Min.	Max.	
16	1,5	4,0	Direct
40	4,0	16,0	
63	6,0	25,0	with lug
100	10	50	

#### **4 DELIVERY SCOPE**

1. Rotary switch PV/PP - 1 pc.
2. Technical manual – 1 pc.

#### **5 SAFETY REQUIREMENTS**

**WARNING!** Hazardous voltage.

By protection method against electric shock, 16A rotary switches belong to protection class 1, while 40-100A rotary switches - to class 2 in compliance with IEC 61140. Rotary switches shall be installed and serviced only by qualified electrical personnel.

Do not operate rotary switches with visual mechanical damage.

For maintenance, follow national safety rules for operation of electrical Installations.

Discontinue operating the switch, if visual damage to the switch housing is found.

Failure to follow the instructions hereof may result in product malfunction, electric shock, or fire.

#### **6 STORAGE AND TRANSPORTATION**

6.1 Rotary switches can be transported by any means of enclosed transport that ensures protection of packed products from mechanical impact and atmospheric exposure.

6.2 Rotary switches shall be stored indoors in the original package at the ambient temperature from -40 °C to + 55 °C and relative humidity of max. 80% at +25°C.

## 7 MANUFACTURER'S WARRANTY

7.1 The manufacturer guarantees the rotary switches comply with the declared characteristics, provided that consumers follow the operation, transportation and storage conditions.

7.2 Warranty period: 7 years from the date of sale specified in the sales receipt.

7.3 Shelf life: 7 years from the date of manufacture specified on the product package or housing.

7.4 Service life: 10 years.

**Manufacturer:** for information, refer to the product package.

**Importer and EKF trademark service representative:**

EKF ELECTRICAL SOLUTION – FZCO, Dubai Silicon Oasis, DDP, Building A2, Dubai, United Arab Emirates.

**Importer and EKF trademark service representative on the territory of the**

**Russian Federation:** 000 «Electroresheniya», Otradnaya st., 2b bld. 9, 5th floor, 127273, Moscow, Russia. Tel.: +7 (495) 788-88-15.

**Importer and EKF trademark service representative on the territory of the Republic of Kazakhstan:**

T00 «Energoresheniya Kazakhstan», Kazakhstan, Almaty, Bostandyk district, Turgut Ozal st., 247, apt 4.

## 8 CERTIFICATE OF ACCEPTANCE

The rotary switches PV and PP EKF have been manufactured in compliance with laws and regulations in force and have been approved for operation.

Date of manufacture:

for information, refer to the product package.

Quality control stamp



EAC



v3

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