



## MULTIPLE POSITION SWITCHES FMV



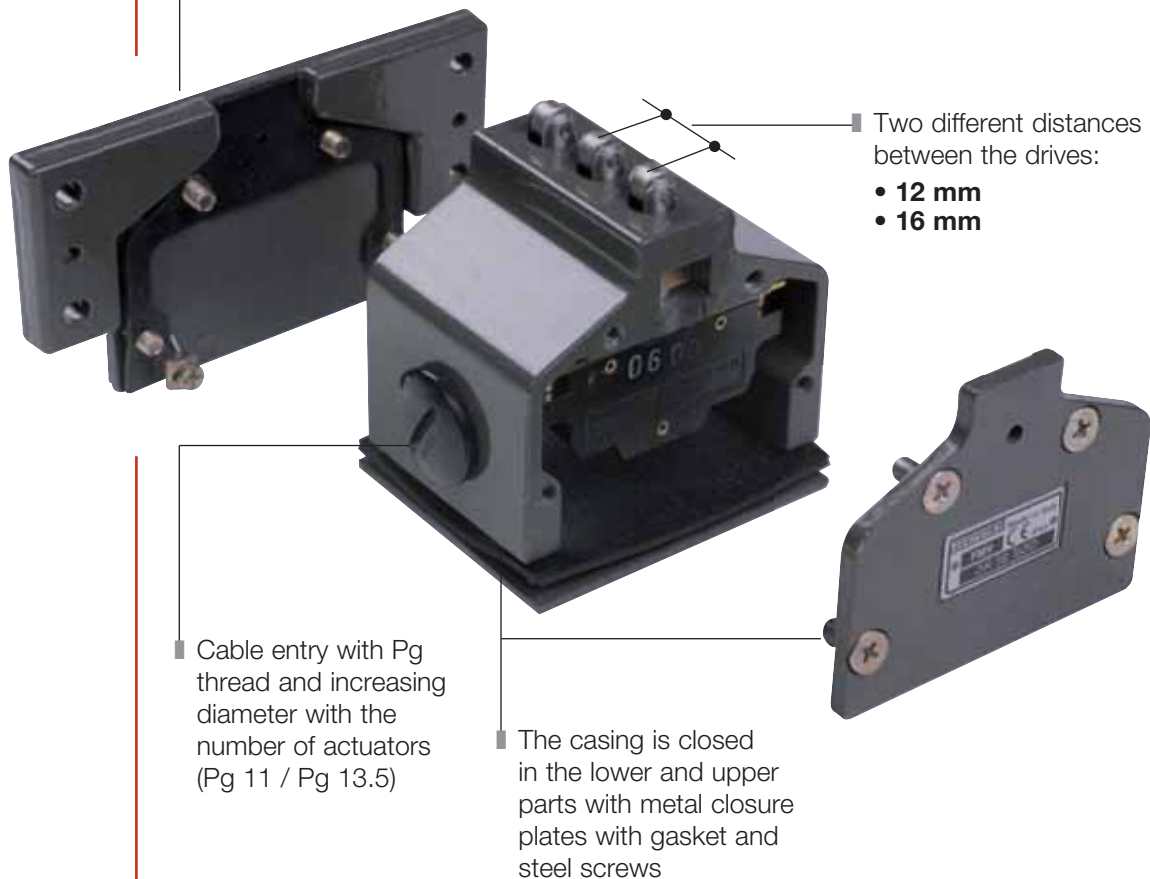
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## General features

The **FMV** series vertical mounting multiple position switches, are an important accessory in the automatic production process for monitoring the moving parts of a machine. Due to their limited dimensions in proportion to the functions performed, the multiple position switches offer the ideal solution to command automatic machines. The body of the multiple position switches is made of die cast metal alloy, while the roller plunger actuators are made of tempered steel.

### ■ Two different mounting brackets:

- 100 (130 for the start of the first actuators at 30 mm)
- 200 (230 for the start of the first actuators at 30 mm)



## Technical data

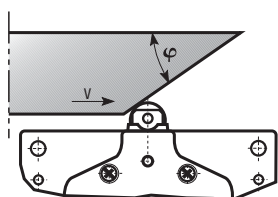
			TYPE	FMV			
Maximum operating frequency		operat./hour <sup>1</sup>		1800			
Insulation resistance		500 V DC	MΩ	100			
Dielectric strenght		50/60 Hz for 1'	V AC	2000 <sup>2</sup>			
Rated insulation voltage	Ui	IEC947-5-1	V AC	500			
Rated thermal current	Ithe	IEC947-5-1	A	10			
Rated operating current	Category AC15 A300	IEC947-5-1/EN60947-5-1	24V	A	10		
			125V	A	10		
			230 V	A	6		
			400 V	A	4		
Contact resistance		IEC255-7 cat.3	initial value	mΩ	25		
Short circuit protective devices		IEC269 (IEC947-5-1)					
		fuse type gL or gG	A		10		
Pollution degree		IEC947-5-1	A		3		
Protection degree		EN 60529			IP64		
Protection against electric shock			metal	class	I		
Vibration resistance		IEC68-2-6		mm	0,35 ± 15% (10 ÷ 55 Hz ± 1 Hz)		
Shock resistance		IEC68-2-27		11ms	g	30	
Mechanical life					cycles	30.000.000	
Electric life		at 250V AC 6A with resistance load cosφ=1			cycles	500.000	
		at 250V AC 6A with inductive load cosφ=0,4			cycles	500.000	
Terminals	Type					Screw with combined notch and retractable plate (notch Ph. Size 1)	
	Screw					M3,5	
	Material					Steel class 8,8 / Galvanized	
	Max. screw tightening torque		Ncm (Kg cm)			120 (12,24)	
	Max connecting capacity	rigid cable		mm <sup>2</sup>			2x1,5
		flexible cable		mm <sup>2</sup>			2x1,5
	with prod terminal					1x1,5	
Terminal numbering						In accordance with EN50013	
Air ambient temperature			operational	°C		-10 ÷ +70 (without formation of ice)	
Relative umidity			operational			95% max	

<sup>1</sup> One operation cycle means two movements, one to close and one to open as required by EN 60947-5

<sup>2</sup> Between terminals with different polarity; between live mechanical parts and ground; between live mechanical parts and non-current-carrying metal parts

## Operating characteristics

### Roller side travel



#### Drive cam operating parameters

φ	V max (m/s)
30°	1
20°	1,5

#### Drive forces

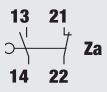
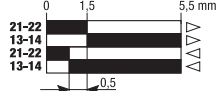
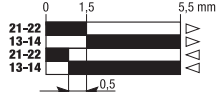
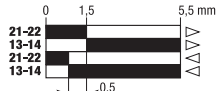
Minimum command force	10 N
Minimum force on lateral travel	18 N

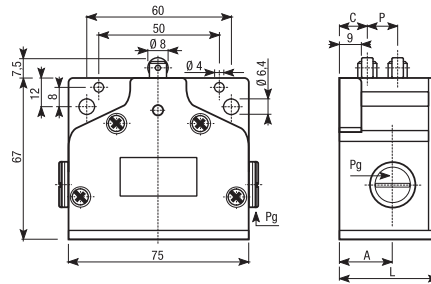


Start 30  
Pitch 12



Vertical mounting bracket 100

Contact element	Metal	No. of roller actuators	Weight (kg)	Pack (pcs)	Travel diagram
snap action 1NO+1NC   <b>FM</b>	FMV2R12130	2 R	0,421	1	
	FMV3R12130	3 R	0,523	1	
	FMV4R12130	4 R	0,621	1	



### Characteristics

Distance between the actuators 12 mm, start 30 mm

Code	No. of actuators	P	C	L	Pg	A
FMV2R12130	2	12	30	54	11	30
FMV3R12130	3	12	30	66	13,5	35
FMV4R12130	4	12	30	78	13,5	35

### Notes:

- P = Pitch (distance between two actuators)
- C = Distance between bracket and first actuator
- L = Overall dimensions
- A = Distance between bracket and input/output holes

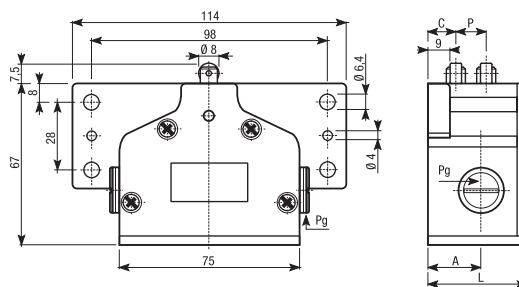
Start 30  
Pitch 12



Vertical mounting bracket 200

Contact element	
snap action 1NO+1NC	
	<b>FM</b>

Metal	No. of roller actuators	Weight (kg)	Pack (pcs)	Travel diagram
FMV3R12230	3 R	0,563	1	
FMV4R12230	4 R	0,662	1	



Characteristics

Distance between the actuators 12 mm, start 30 mm

Code	No. of actuators	P	C	L	Pg	A
FMV3R12230	3	12	30	66	13,5	35
FMV4R12230	4	12	30	78	13,5	35

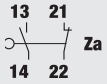
Notes:

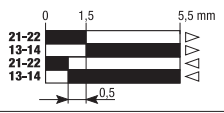
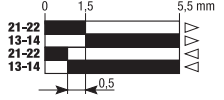
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- L = Overall dimensions
- A = Distance between bracket and input/output holes

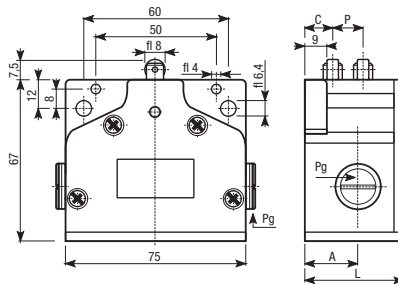
Start 30  
Pitch 16



Vertical mounting bracket 100

Contact element	
snap action 1NO+1NC	
	<b>FM</b>

Metal	No. of roller actuators	Weight (kg)	Pack (pcs)	Travel diagram
FMV2R16130	2 R	0,470	1	
FMV3R16130	3 R	0,584	1	



### Characteristics

Distance between the actuators 16 mm, start 30 mm

Code	No. of actuators	P	C	L	Pg	A
FMV2R16130	2	16	30	62	11	30
FMV3R16130	3	16	30	78	13,5	35

### Notes:

- P = Pitch (distance between two actuators)
- C = Distance between bracket and first actuator
- L = Overall dimensions
- A = Distance between bracket and input/output holes

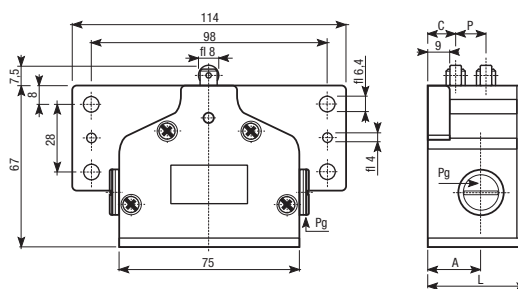
Start 30  
Pitch 16



Vertical mounting bracket 200

Contact element	
snap action 1NO+1NC	
	<b>FM</b>

Metal	No. of roller actuators	Weight (kg)	Pack (pcs)	Travel diagram
FMV3R16230	3 R	0,629	1	
FMV4R16230	4 R	0,748	1	



Characteristics

Distance between the actuators 16 mm, start 30 mm

Code	No. of actuators	P	C	L	Pg	A
FMV3R16230	3	16	30	78	13,5	35
FMV4R16230	4	16	30	94	13,5	35

Notes:

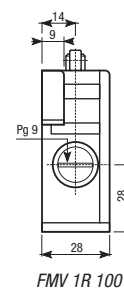
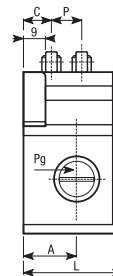
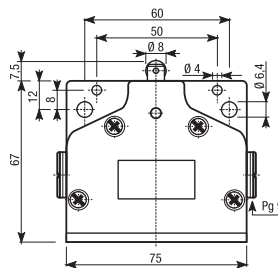
- P = Pitch (distance between two actuators)
- C = Distance between bracket and first actuator
- L = Overall dimensions
- A = Distance between bracket and input/output holes

Start 12  
Pitch 12



Vertical mounting bracket 100

Contact element	Metal	No. of roller actuators	Weight (kg)	Pack (pcs)	Travel diagram
snap action 1NO+1NC   <b>FM</b>	FMV1R100	1 R	0,266	1	
	FMV2R12100	2 R	0,363	1	
	FMV3R12100	3 R	0,455	1	
	FMV4R12100	4 R	0,528	1	



### Characteristics

Distance between the actuators 12 mm, start 12 mm

Code	No. of actuators	P	C	L	Pg	A
FMV2R12100	2	12	12	41	11	22
FMV3R12100	3	12	12	53	13,5	30
FMV4R12100	4	12	12	60	13,5	30

### Notes:

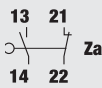
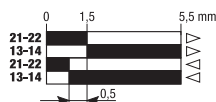
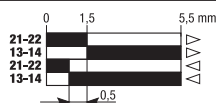
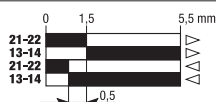
- P = Pitch (distance between two actuators)
- C = Distance between bracket and first actuator
- L = Overall dimensions
- A = Distance between bracket and input/output holes

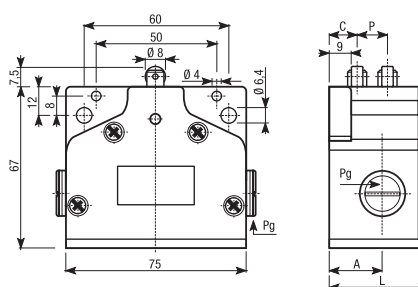


Start 16  
Pitch 16



Vertical mounting bracket 100

Contact element	Metal	No. of roller actuators	Weight (kg)	Pack (pcs)	Travel diagram
snap action 1NO+1NC  	FMV2R16100	2 R	0,405	1	
	FMV3R16100	3 R	0,521	1	
	FMV4R16100	4 R	0,642	1	


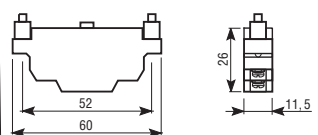


Characteristics						
Distance between the actuators 16 mm, start 16 mm						
Code	No. of actuators	P	C	L	Pg	A
FMV2R16100	2	16	16	48	11	22
FMV3R16100	3	16	16	64	13,5	30
FMV4R16100	4	16	16	80	13,5	30

Notes:  
 P = Pitch (distance between two actuators)  
 C = Distance between bracket and first actuator  
 L = Overall dimensions  
 A = Distance between bracket and input/output holes



Contact element

Contact element	Code	Description	Weight (kg)	Pack (pcs)	
	FM	Mechanical contact element	0,025	5	

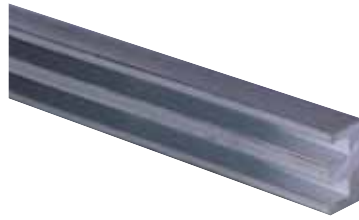


Cams

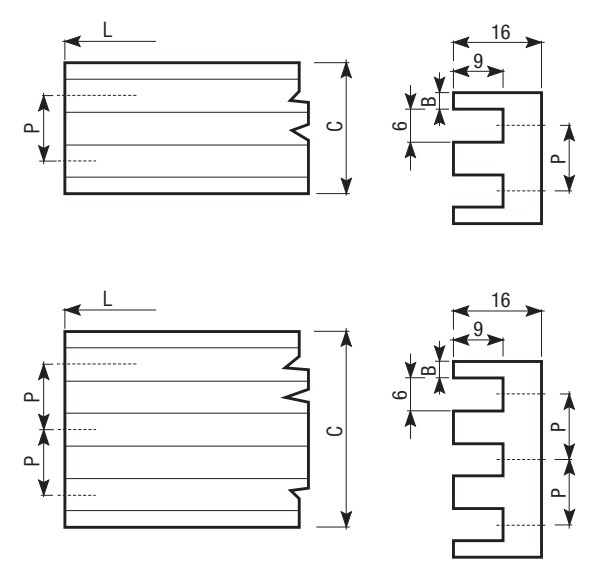
Code	Description	Form	Weight (kg)	Pack (pcs)	
C1N	Tempered grinded steel cam according to DIN 69639	UA	0,025	1	Side view 
C2N	Tempered grinded steel cam according to DIN 69639	UA	0,030	1	
C3N	Tempered grinded steel cam		0,033	1	
C4N	Tempered grinded steel cam	UA	0,033	1	C1N 
C5N	Tempered grinded steel cam	UA	0,044	1	
C6N	Tempered grinded steel cam	UB	0,062	1	C6N-C7N-C8N-C9N-C10N 
C7N	Tempered grinded steel cam according to DIN 69639	UB	0,081	1	
C8N	Tempered grinded steel cam according to DIN 69639	UB	0,127	1	
C9N	Tempered grinded steel cam according to DIN 69639	UB	0,150	1	
C10N	Tempered grinded steel cam according to DIN 69639		0,179	1	

## Characteristics

Code	L1	L2	Form	Code	L1	L2	Form
C1N	0	25	UA	C6N	25	59,5	UB
C2N	4	29	UA	C7N	40	74	UB
C3N	6,3	31		C8N	63	114,5	UB
C4N	10	35	UA	C9N	100	134	UB
C5N	16	41	UA	C10N	125	147,5	



Assembly profile

Code	Description	Weight (kg)	Pack (pcs)	
G2121	Assembly profile in accordance with DIN 69368	0,713	1	
G2122	Assembly profile in accordance with DIN 69368	1,428	1	
G2161	Assembly profile in accordance with DIN 69368	1,080	1	
G2162	Assembly profile in accordance with DIN 69368	2,149	1	
G3121	Assembly profile in accordance with DIN 69368	1,080	1	
G3122	Assembly profile in accordance with DIN 69368	2,147	1	
G3161	Assembly profile in accordance with DIN 69368	1,613	1	
G3162	Assembly profile in accordance with DIN 69368	3,220	1	

Characteristics

Code	P	B	C	L
G2121	12	3	24	1000
G2122	12	3	24	2000
G2161	16	5	32	1000
G2162	16	5	32	2000
G3121	12	3	36	1000
G3122	12	3	36	2000
G3161	16	5	48	1000
G3162	16	5	48	2000

Notes:

- P = Pitch, distance between two channels
- L = Overall rail length
- C = Overall rail width
- B = Lateral thickness
- G2 = Linear cam tray with 2 channels
- G3 = Linear cam tray with 3 channels