



Multiple
position
switches FMV

**General
characteristics**

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.

Roller plunger actuators

Steel roller plunger actuators to guarantee maximum performance and reliability



■ Contact blocks with positive opening of the NC contact according to IEC EN 60947-5-1 e VD 0660-206

Cable entry

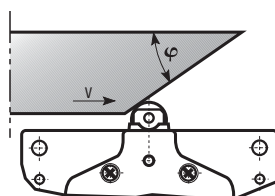
Cable entries with Pg thread, Pg 11 or Pg 13,5 depending on the number of actuators.

Technical information

Operating speed		mm/s	1...1500
Operating frequency		Hz (operations/s)	0.5 max
Insulation resistance		500 V DC MΩ	100
Dielectric insulation		50/60 Hz for 1' *	V AC 2000
Rated insulation voltage	Ui IEC947-5-1	V AC	500
Rated thermal current	Ithe IEC947-5-1	A	10
Rated operational current	IEC947-5-1/EN60947-5-1		
Category AC15 A300	le	24 V A	10
		125 V A	10
		230 V A	6
		400 V A	4
	Category DC13 Q300	24 V A	10
		48 V A	4
		120 V A	1
		250 V A	0,4
Contact resistance	IEC255-7 cat.3	initial value m	25
Short circuit protective devices	IEC269 (IEC947-5-1) gl or gG type fuse	A	10
Pollution degree	IEC947-5-1		3
Protection degree	EN 60529		IP64
Protection against voltage peaks		Metal Class	I
Vibrations resistance	IEC68-2-6	mm	0,35 ±5% (10 ÷ 55 Hz ±1 Hz)
Shock resistance	IEC68-2-27	11 ms g	30
Mechanical life		cycles	30.000.000
Electrical life	a 250 V AC 6A con with resistance load cosφ=1	min cycles	500.000
	a 250 V AC 6A con with inductive load cosφ=0,4	min cycles	500.000
Terminals	type		Screw with combined notch and removable plate Ph notch, size 1 (M3 series)
	screw	M	3,5
	material		Class 8.8 galvanised steel
	max screw tightening force	cNm (Kg cm)	120 (12,24)
	max connecting sections	rigid cable mm²	2x1,5
		flexible cable mm²	2x1,5
	with prod terminal	mm²	1x1,5
	terminal numbering		in accordance with EN50013
Air ambient temperature	operationals	°C	-10 ÷ +70 (without formation of ice)
Relative operating humidity	operationals		95% max

* between live mechanical parts and mass; between live mechanical parts and unpowered mechanical parts

Side actuated roller plunger



Operating cam parameters

φ	V max (m/s)
20°	1,5
30°	1

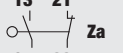
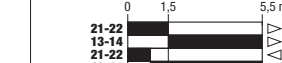
Tripping forces

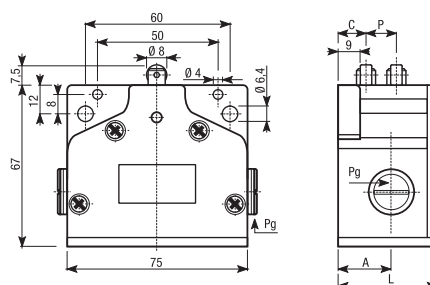
Minimum force for tripping	10 N
Minimum force on lateral travel	18 N

- Start 30
Pitch 12



Vertical mounting bracket 100

Contact block		Part no. / Type	No. of roller actuators	Weight (kg)	Pack (pcs)	Travel diagram
snap action 1NO+1NC 	FM	ER400110 <i>FMV 2R 12 130</i>	2 R	0,421	1	
		ER401310 <i>FMV 3R 12 130</i>	3 R	0,523	1	
		ER402510 <i>FMV 4R 12 130</i>	4 R	0,621	1	

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Characteristics

Distance between the actuators 12 mm, start 30 mm

Type	No. of actuators	P	C	L	Pg	A
FMV 2R 12 130	2	12	30	54	11	30
FMV 3R 12 130	3	12	30	66	13,5	35
FMV 4R 12 130	4	12	30	78	13,5	35
FMV 3R 12 230	3	12	30	66	13,5	35
FMV 4R 12 230	4	12	30	78	13,5	35

Notes:

P = Pitch (distance between two actuators)

C = Distance between bracket and first actuator

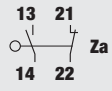
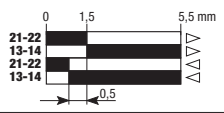
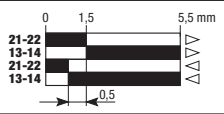
L = Overall dimensions

A = Distance between bracket and input/output holes

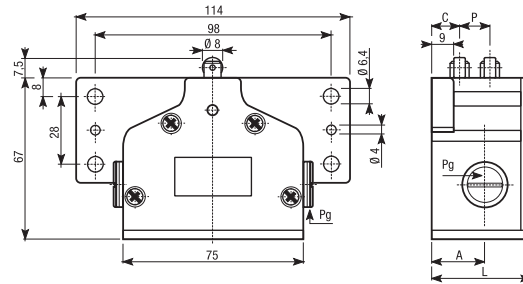
Start 30
Pitch 12



Vertical mounting bracket 200

Contact block	Part no. / Type	No. of roller actuators	Weight (kg)	Pack (pcs)	Travel diagram
snap action 1NO+1NC  FM	ER401410 <i>FMV 3R 12 230</i>	3 R	0,563	1	
	ER402610 <i>FMV 4R 12 230</i>	4 R	0,662	1	

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Characteristics

Distance between the actuators 12 mm, start 30 mm

Type	No. of actuators	P	C	L	Pg	A
FMV 2R 12 130	2	12	30	54	11	30
FMV 3R 12 130	3	12	30	66	13,5	35
FMV 4R 12 130	4	12	30	78	13,5	35
FMV 3R 12 230	3	12	30	66	13,5	35
FMV 4R 12 230	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 16



Vertical mounting bracket 100

Contact block	Part no. / Type	No. of roller actuators	Weight (kg)	Pack (pcs)	Travel diagram
snap action 1NO+1NC FM	ER400510 <i>FMV 2R 16 130</i>	2 R	0,470	1	
	ER401710 <i>FMV 3R 16 130</i>	3 R	0,584	1	

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Characteristics

Distance between the actuators 16 mm, start 30 mm

Type	No. of actuators	P	C	L	Pg	A
FMV 2R 16 130	2	16	30	62	11	30
FMV 3R 16 130	3	16	30	78	13,5	35
FMV 3R 16 230	3	16	30	78	13,5	35
FMV 4R 16 230	4	16	30	94	13,5	35

Notes:

P = Pitch (distance between two actuators)

C = Distance between bracket and first actuator

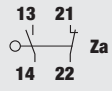
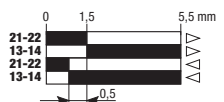
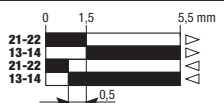
L = Overall dimensions

A = Distance between bracket and input/output holes

Start 30
Pitch 16



Vertical mounting bracket 200

Contact block	Part no. / Type	No. of roller actuators	Weight (kg)	Pack (pcs)	Travel diagram
snap action 1NO+1NC  FM	ER401810 <i>FMV 3R 16 230</i>	3 R	0,629	1	
	ER403010 <i>FMV 4R 16 230</i>	4 R	0,748	1	

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Characteristics

Distance between the actuators 16 mm, start 30 mm

Type	No. of actuators	P	C	L	Pg	A
FMV 2R 16 130	2	16	30	62	11	30
FMV 3R 16 130	3	16	30	78	13,5	35
FMV 3R 16 230	3	16	30	78	13,5	35
FMV 4R 16 230	4	16	30	94	13,5	35

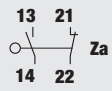
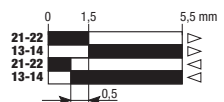
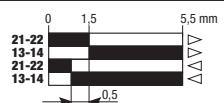
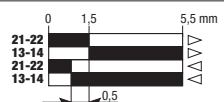
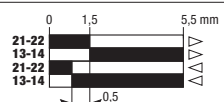
Notes:

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

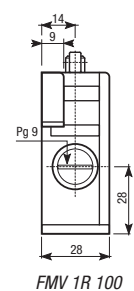
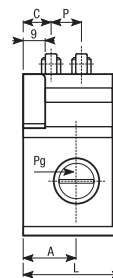
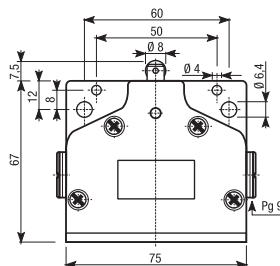
Start 12
Pitch 12



Vertical mounting bracket 100

Contact block	Part no. / Type	No. of roller actuators	Weight (kg)	Pack (pcs)	Travel diagram
snap action 1NO+1NC  FM	ER400090 <i>FMV 1R 100</i>	1 R	0,266	1	
	ER400910 <i>FMV 2R 12 100</i>	2 R	0,363	1	
	ER402110 <i>FMV 3R 12 100</i>	3 R	0,455	1	
	ER403310 <i>FMV 4R 12 100</i>	4 R	0,528	1	

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Characteristics

Distance between the actuators 12 mm, start 12 mm

Type	No. of actuators	P	C	L	Pg	A
FMV 2R 12 100	2	12	12	41	11	22
FMV 3R 12 100	3	12	12	53	13,5	30
FMV 4R 12 100	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



Contact block

Contact block	Part no. / Type	Description	Weight (kg)	Pack (pcs)		
1321 1422 Za	ER409200 FM	Mechanical Contact block	0,025	5		

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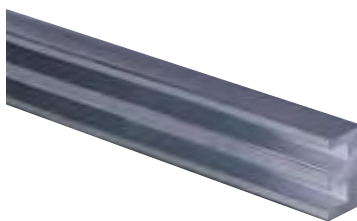


Cams

Part no. / Type	Description	Form	Weight (kg)	Pack (pcs)	
ERCN0210 <i>C1N</i>	Tempered grinded steel cam according to DIN 69639	UA	0,025	1	Side view C1N C2N-C3N-C4N-C5N C6N-C7N-C8N-C9N-C10N
ERCN0220 <i>C2N</i>	Tempered grinded steel cam according to DIN 69639	UA	0,030	1	
ERCN0230 <i>C3N</i>	Tempered grinded steel cam		0,033	1	
ERCN0240 <i>C4N</i>	Tempered grinded steel cam	UA	0,033	1	
ERCN0250 <i>C5N</i>	Tempered grinded steel cam	UA	0,044	1	
ERCN0260 <i>C6N</i>	Tempered grinded steel cam	UB	0,062	1	
ERCN0270 <i>C7N</i>	Tempered grinded steel cam according to DIN 69639	UB	0,081	1	
ERCN0280 <i>C8N</i>	Tempered grinded steel cam according to DIN 69639	UB	0,127	1	
ERCN0290 <i>C9N</i>	Tempered grinded steel cam according to DIN 69639	UB	0,150	1	
ERCN0300 <i>C10N</i>	Tempered grinded steel cam according to DIN 69639		0,179	1	

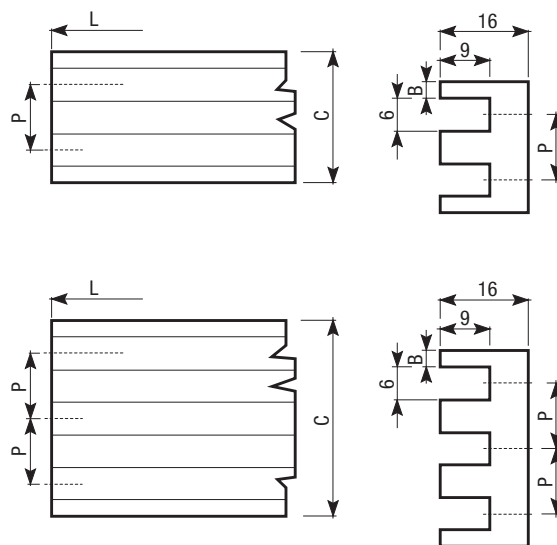
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Characteristics							
Type	L1	L2	Form	Type	L1	L2	Form
C1N	0	25	UA	C6N	25	59,5	UB
C2N	4	29	UA	C7N	40	74	UB
C3N	6,3	31		C8N	63	114,5	UB
C4N	10	35	UA	C9N	100	134	UB
C5N	16	41	UA	C10N	125	147,5	



Assembly profile

Part no. / Type	Description	Weight (kg)	Pack (pcs)	
ERC00010 G2.12.1	Assembly profile in accordance with DIN 69368	0,713	1	
ERC00020 G2.12.2	Assembly profile in accordance with DIN 69368	1,428	1	
ERC00030 G2.16.1	Assembly profile in accordance with DIN 69368	1,080	1	
ERC00040 G2.16.2	Assembly profile in accordance with DIN 69368	2,149	1	
ERC00050 G3.12.1	Assembly profile in accordance with DIN 69368	1,080	1	
ERC00060 G3.12.2	Assembly profile in accordance with DIN 69368	2,147	1	
ERC00070 G3.16.1	Assembly profile in accordance with DIN 69368	1,613	1	
ERC00080 G3.16.2	Assembly profile in accordance with DIN 69368	3,220	1	



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Characteristics

Type	P	B	C	L
G2.12.1	12	3	24	1000
G2.12.2	12	3	24	2000
G2.16.1	16	5	32	1000
G2.16.2	16	5	32	2000
G3.12.1	12	3	36	1000
G3.12.2	12	3	36	2000
G3.16.1	16	5	48	1000
G3.16.2	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