

Comepi Safety Limit Switches

These limit switches are developed and manufactured according to IEC and EN European standards.

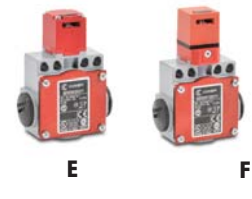
Easy to use, electromechanical limit switches provide:

- Visible operation
- Ability to switch large currents (10 A conventional thermal current)
- Precise operating points (consistency)

- Immunity to electromagnetic disturbances
- Electrically separated contacts (Zb)
- N.C. contacts with positive opening operation ⊕
- Actuation Speed: Max. - 0.5 m/s; Min. - 0.01 m/s
- Conduit opening - 1/2" NPT threaded or adapter

Note: Purchase actuating tongue (key) separately.

Safety Limit Switches											
Part Number	Price	Actuator Type	No. of Conduit Holes	Min Force for Key Actuation	Min Torque	Positive Opening Force	B10 _d	Dimensions Body / Head	Contact Config. Diagram	Weight (lbs.)	Photo
SP2K20X11	<-->	90° adjustable head, tongue (key) interlock	One	15N		30N	2,000,000 operations	Figures 1, 5	1	0.2	A
SP2K20W02	<-->		One					Figures 1, 5	2	0.2	A
SP2K120X11	<-->	One	Figures 1, 6					1	0.2	B	
SP2K120W02	<-->	One	Figures 1, 6					2	0.2	B	
SP2K72X11	<-->	90° adjustable head, shaft hinge interlock	One	0.12 Nm	0.60 Nm			Figures 1, 7	1	0.2	C
SP2K72W02	<-->		One					Figures 1, 7	2	0.2	C
SP2K61X11	<-->	One	Figures 1, 8					1	0.2	D	
SP2K61W02	<-->	One	Figures 1, 8					2	0.2	D	
SDM2K20X11	<-->	90° adjustable head, tongue (key) interlock	Three	15N		30N		Figures 2, 5	1	0.6	E
SDM2K20W02	<-->		Three					Figures 2, 5	2	0.6	E
SDM2K120X11	<-->	Three	Figures 2, 6					1	0.6	F	
SDM2K120W02	<-->	Three	Figures 2, 6					2	0.6	F	
SDM2K72X11	<-->	90° adjustable head, shaft hinge interlock	Three	0.12 Nm	0.60 Nm			Figures 2, 7	1	0.6	G
SDM2K72W02	<-->		Three					Figures 2, 7	2	0.6	G
SDM2K61X11	<-->	Three	Figures 2, 8					1	0.6	H	
SDM2K61W02	<-->	Three	Figures 2, 8					2	0.6	H	
SDM2K96X11	<-->	Cable-pull interlock, no reset	Three				25,000 operations	Figures 2, 9	1	0.6	I
SDM2K96W02	<-->		Three					Figures 2, 9	2	0.6	I
SDM2K98X11	<-->	Three	Figures 2, 10					1	0.6	J	
SDM2K98W02	<-->	Three	Figures 2, 10					2	0.6	J	
SBM2K40X11	<-->	90° adjustable head, tongue (key) interlock	One	30N		45N	2,000,000 operations	Figures 3, 11	1	0.4	K
SBM2K40W02	<-->		One					Figures 3, 11	2	0.4	K
SBM2K40X12	<-->		One					Figures 3, 11	3	0.4	K
SBM2K40W03	<-->		One					Figures 3, 11	4	0.4	K
SBM2K97X11	<-->	Cable-pull interlock, no reset	One				25,000 operations	Figures 3, 12	1	0.6	L
SBM2K97W02	<-->		One					Figures 3, 12	2	0.6	L
SBM2K97X12	<-->		One					Figures 3, 12	3	0.6	L
SBM2K97W03	<-->		One					Figures 3, 12	4	0.6	L
SBM2K99X11	<-->	Cable-pull interlock with reset	One					Figures 3, 13	1	0.6	M
SBM2K99W02	<-->		One					Figures 3, 13	2	0.6	M
SBM2K99X12	<-->		One					Figures 3, 13	3	0.6	M
SBM2K99W03	<-->		One					Figures 3, 13	4	0.6	M
SCM2K40X11	<-->	90° adjustable head, tongue (key) interlock	Three	30N		45N	2,000,000 operations	Figures 4, 11	1	0.5	N
SCM2K40W02	<-->		Three					Figures 4, 11	2	0.5	N
SCM2K40X12	<-->		Three					Figures 4, 11	3	0.5	N
SCM2K40W03	<-->		Three					Figures 4, 11	4	0.5	N
SCM2K97X11	<-->	Cable-pull interlock, no reset	Three				25,000 operations	Figures 4, 12	1	0.7	O
SCM2K97W02	<-->		Three					Figures 4, 12	2	0.7	O
SCM2K97X12	<-->		Three					Figures 4, 12	3	0.7	O
SCM2K97W03	<-->		Three					Figures 4, 12	4	0.7	O
SCM2K99X11	<-->	Cable-pull interlock with reset	Three					Figures 4, 13	1	0.7	P
SCM2K99W02	<-->		Three					Figures 4, 13	2	0.7	P
SCM2K99X12	<-->		Three					Figures 4, 13	3	0.7	P
SCM2K99W03	<-->		Three					Figures 4, 13	4	0.7	P



Company Information

Systems Overview

Programmable Controllers

Field I/O

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Steppers/Servos

Motor Controls

Proximity Sensors

Photo Sensors

Limit Switches

Encoders

Current Sensors

Pressure Sensors

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Relays/Timers

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Terminal Blocks & Wiring

Power

Circuit Protection

Enclosures

Tools

Pneumatics

Appendix

Product Index

Part # Index

Comepi Safety Limit Switches

Switch Body Dimensions mm [in]

Figure 1: SP2K body

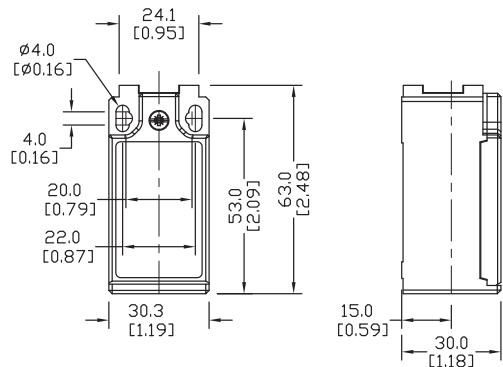


Figure 2: SDM2K body

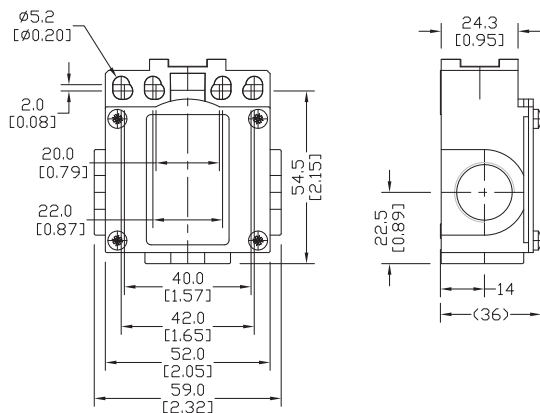


Figure 3 : SBM2K body

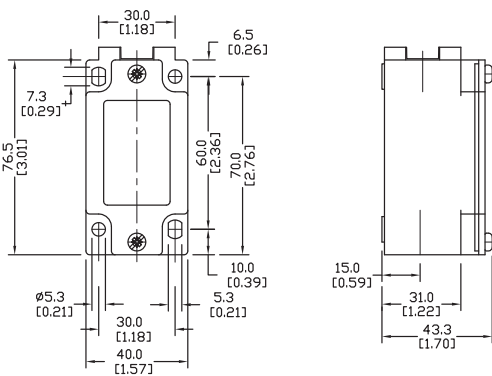
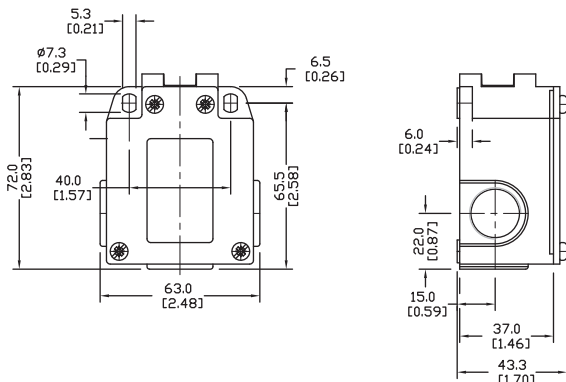


Figure 4: SCM2K body



Actuator Dimensions mm [in]

Figure 5: 90° adjustable head - SP2K20, SDM2K20 models

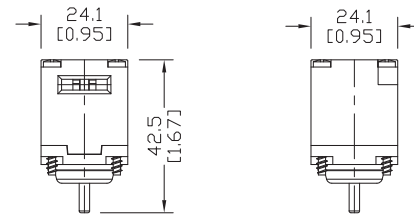


Figure 6: Fully turnable 360° head - SP2K120, SDM2K120 models

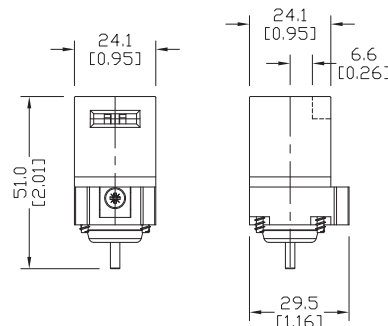


Figure 7: 90° adjustable head with shaft hinge interlock - SP2K72, SDM2K72 models

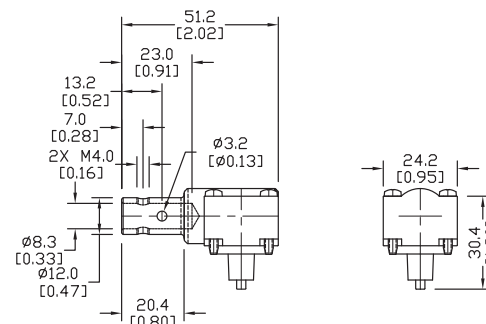
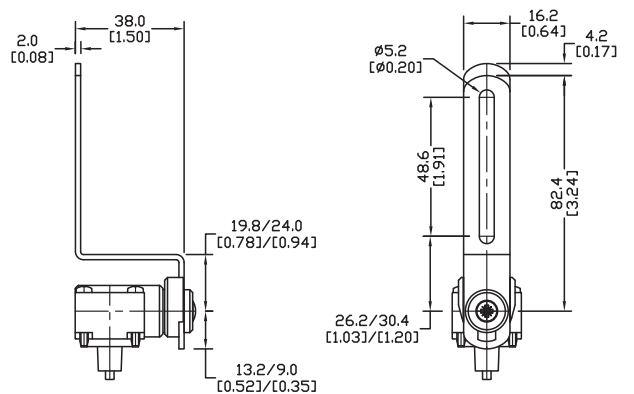


Figure 8: 90° adjustable head with lever hinge interlock - SP2K61, SDM2K61 models



Comepi Safety Limit Switches

Actuators Dimensions mm [in]

Figure 9: Pull wire without reset for simple stop - SDM2K96 models

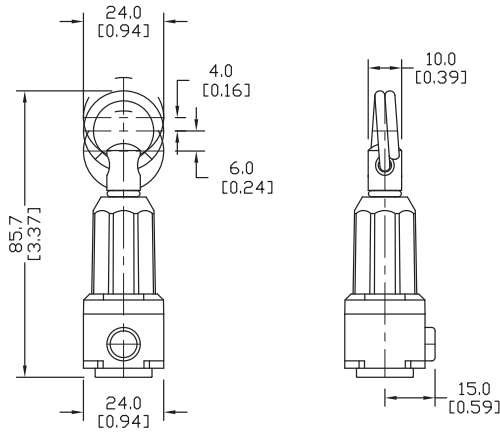


Figure 12: Pull wire without reset for simple stop - SBM2K97 and SCM2K97 models

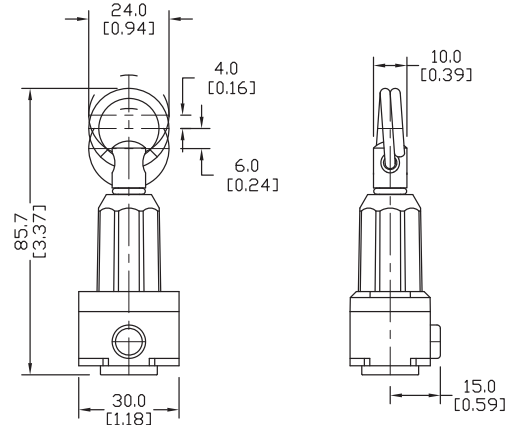


Figure 10: Pull wire with reset for emergency stop - SDM2K98 models

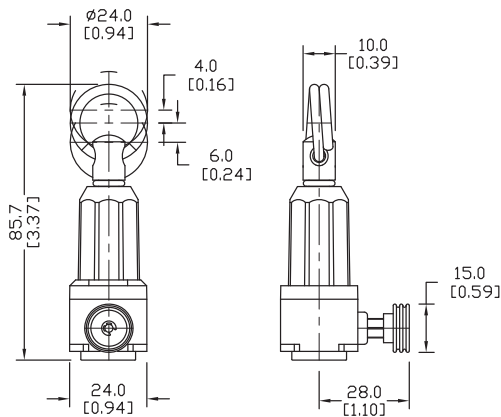


Figure 13: Pull wire with reset for emergency stop - SBM2K99 and SCM2K99 models

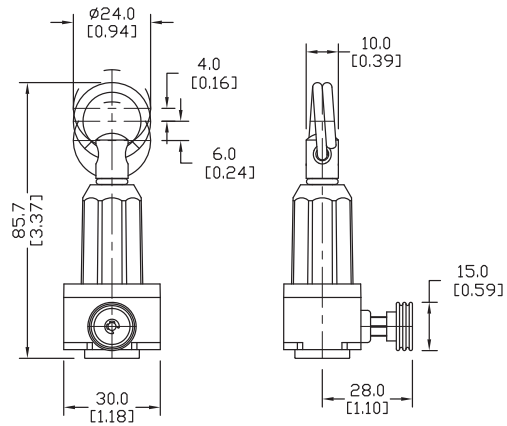
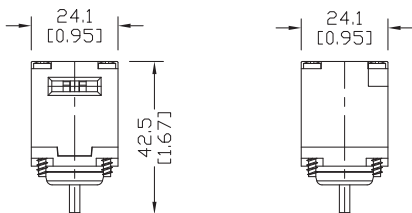


Figure 11: 90° adjustable head - SBM2K40, SCM2K40 models



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- Visible operation
- Ability to switch large currents (10 A conventional thermal current)

- Precise operating points (consistency)
- Immunity to electromagnetic disturbances
- Electrically separated contacts (Zb)
- N.C. contacts with positive opening operation \rightarrow
- Conduit threads - 1/2" NPT adapter



AP2R Series Safety Limit Switches Selection Chart											
Part Number	Price	Actuator Type	No. of Conduit Holes	Max. Actuation Speed (m/s)	Min. Actuation Force (N) / Torque (Nm)	Min. Positive Opening Force (N) / Torque (Nm)	B10 _d	Head Dimensions	Contact Config. Diagram	Weight (lbs.)	Photo
AP2R11X11	<--->	Steel plunger with reset	One	0.5	9N	44N	2,000,000 operations	Figure 1	1	0.2	A
AP2R11W02	<--->		One					Figure 1	2	0.2	
AP2R13X11	<--->	Steel plunger with nylon roller with reset	One	0.3	12N	44N		Figure 2	1	0.2	B
AP2R13W02	<--->		One					Figure 2	2	0.2	
AP2R31X11	<--->	Steel plunger with one-way horizontal actuated nylon roller with reset	One	1.0	7N	24N		Figure 3	1	0.2	C
AP2R31W02	<--->		One					Figure 3	2	0.2	
AP2R32X11	<--->	Steel plunger with one-way vertical actuated nylon roller with reset	One					Figure 4	1	0.2	D
AP2R32W02	<--->		One					Figure 4	2	0.2	
AP2R41X11	<--->	Lever with nylon roller with reset	One	1.5	0.10Nm	0.32Nm		Figure 5	1	0.2	E
AP2R41W02	<--->		One					Figure 5	2	0.2	
AP2R51X11	<--->	Adjustable lever with nylon roller with reset	One					Figure 6	1	0.2	F
AP2R51W02	<--->		One					Figure 6	2	0.2	

Dimensions mm [in]

AP2R Series Body

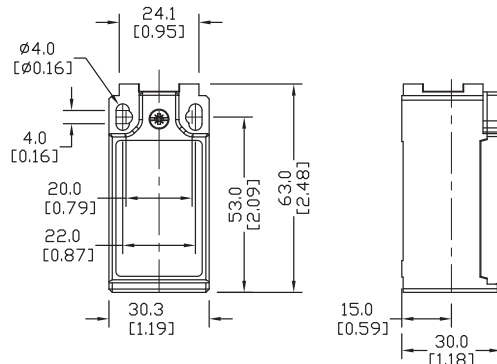
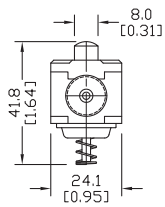
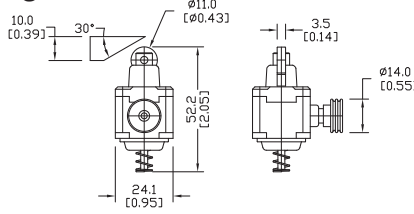


Figure 1



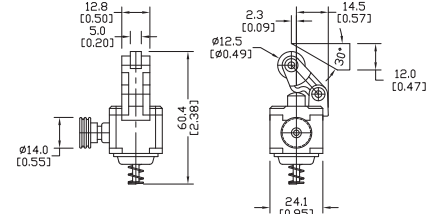
AP2R11

Figure 2



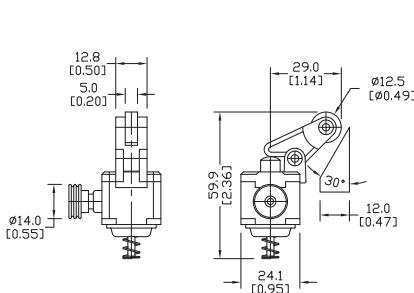
AP2R13

Figure 3



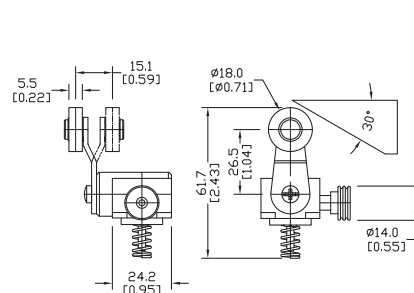
AP2R31

Figure 4



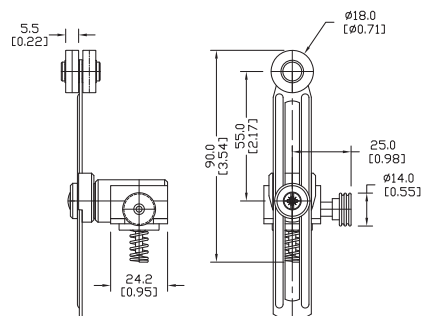
AP2R32

Figure 5



AP2R41

Figure 6



AP2R51

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Appendix

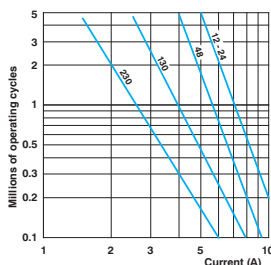
Product Index

Part # Index

Approvals	
All: IEC 947-5-1, EN 60947-5-1, UL 508, CSA C22.2 No 14, RoHS	
Environmental	
Degree of Protection	Plastic models: IP65 according to IEC 529 Aluminum and ZAMAK (zinc alloy) models: IP66 according to IEC 529
Temperature Range	Plastic models: storage: -30° to 80°C (-22° to 176°F) operating: -25° to 70°C (-13° to 158°F) Aluminum and ZAMAK (zinc alloy) models: storage: -30° to 80°C (-22° to 176°F) operating: -25° to 70°C (-13° to 158°F); minimum temperatures assume that the atmosphere is free of moisture, which could cause moving parts to freeze up.
Rated Insulation Voltage	SDM:400V, All others 500V; (degree of pollution - 3)
Mechanical Ratings	
Mechanical Life	1 million operations. Pull wire models - 25,000 operations
Enclosure Material	Plastic models: fiberglass-reinforced plastic-V0 class (UL94); aluminum models: die-cast aluminum; ZAMAK models: zinc alloy
Contact Blocks Rating	
Positive Opening	Yes, all models
Electrical Ratings	AC15 Make: 60A@120VAC; 30A @ 240VAC; 18A @ 400VAC Break:10A @ 24VAC; 6.5A @130VAC; 3.1A @ 230VAC; 1.8A @ 400VAC
	DC13 2.8A @ 24VDC; 0.5A @ 110VDC
Maximum Switching Frequency	Contact blocks: all one cycle per second
Repeat Accuracy	0.01mm on the operating points at 1 million operations
Short-Circuit Protection	Cartridge fuses, general purpose, gl 10A-500V 10.3x38 1 100KA
Contact Resistance	25 milli Ω
Recommended Minimum Operating Speed	With slow-action contacts: 500 mm per minute*
Rated Insulation Voltage	660V
Terminals Marking	According to CENELEC EN 50013
Wiring Connections	2 x 2.5mm ² (AWG14) to 2 x 0.5mm ² (AWG18)
Wiring Terminal Type	Captive screw with self-lifting pressure plate
Wiring Terminal Markings	According to CENELEC EN50013
User Protection	Double insulation (plastic models only)
Contact Blocks Performance	
Operation Frequency	3600 ops/h
Electrical Durability (according to IEC 947-5-1)	Utilization categories AC-15 and DC-13; load factor of 0.5. See table and curves below.
Tools Needed	
Phillips screwdriver, #1 #2 / Hex wrench, 10mm	
*Note: Slow-action contacts must not be operated at very low speeds because of the tendency to maintain the arc if contacts are not rapidly separated.	

Electrical Durability (according to IEC 947-5-1)

AC-15 Slow Action



DC-13	Slow Action
	Power breaking for a durability of 5 million cycles
24 Volts	12W
48 Volts	9W
110 Volts	6W

Comepi Safety Limit Switches

Contacts Configuraton Charts

Chart 1

X11 Slow action break before make 1NO+1NC

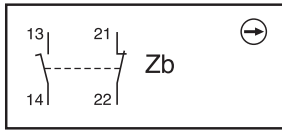


Chart 2

W02 Simultaneous slow action 2NC

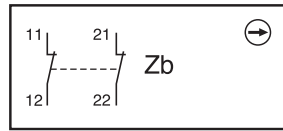


Chart 3

X12 Slow action break before make 1NO+2NC

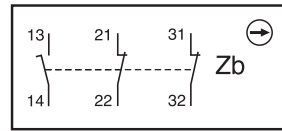
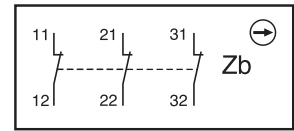


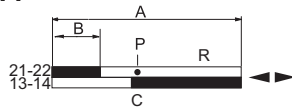
Chart 4

W03 Simultaneous slow action 3NC

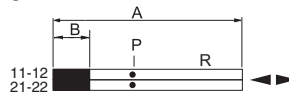


Bar charts for keys, shaft lever or limit switches

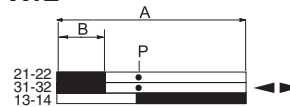
X11



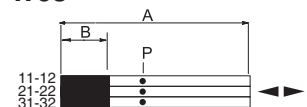
W02



X12



W03



A = Max. travel of the operator in mm or degrees

B = Tripping travel of the N.C. contact

C = Tripping travel of the N.O. contact

P = Point from which positive opening is assured

R = Reset latch activates

= Contact open

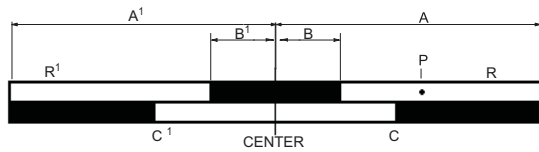
= Contact closed

Part Series	Contact Configuration	Displacement Values mm(in) or degrees				
		A	B	C	P	R
SP2K20, SP2K120, SDM2K20, SDM2K120 Top Key Extraction	X11	21.5 (0.85)	2.0 (0.08)	3.0 (0.12)	3.5 (0.14)	–
	W02	21.5 (0.85)	1.8 (0.07)	–	3.3 (0.13)	–
SP2K20, SP2K120, SDM2K20, SDM2K120 Front Key Extraction	X11	21.5 (0.85)	3.8 (0.15)	4.8(0.19)	5.3 (0.21)	–
	W02	21.5 (0.85)	3.5 (0.14)	–	5.0 (0.20)	–
SP2K72, SP2K61, SDM2K72, SDM2K61	X11	±90°	±6°	±15°	±31°	–
	W02	±90°	±5°	–	±30°	–
SBM2K40, SCM2K40 Top Key Extraction	X11	26.6 (1.05)	4.6 (0.18)	6.1 (0.24)	5.8 (0.23)	–
	W02	26.6 (1.05)	4.1 (0.16)	–	5.6 (0.22)	–
	X12	26.6 (1.05)	4.3 (0.17)	5.8 (0.23)	5.5 (0.21)	–
	W03	26.6 (1.05)	4.1 (0.16)	–	5.6 (0.22)	–
SBM2K40, SCM2K40 Front Key Extraction	X11	26.6 (1.05)	5.8 (0.23)	7.3 (0.29)	7.0 (0.28)	–
	W02	26.6 (1.05)	5.3 (0.21)	–	6.8 (0.27)	–
	X12	26.6 (1.05)	5.5 (0.21)	7.0 (0.28)	6.7 (0.26)	–
	W03	26.6 (1.05)	5.3 (0.21)	–	6.8 (0.27)	–
AP2R11	X11	5.6 (0.22)	1.6 (0.06)	2.5 (0.10)	3.2 (0.13)	4.4 (0.17)
	W02	5.6 (0.22)	1.5 (0.06)	–	3.1 (0.12)	4.4 (0.17)
AP2R13	X11	9.6 (0.38)	3.2 (0.13)	4.6 (0.18)	6.0 (0.23)	7.5 (0.30)
	W02	9.6 (0.38)	3.0 (0.12)	–	5.9 (0.23)	7.5 (0.30)
AP2R31, AP2R32	X11	21.0 (0.83)	6.0 (0.24)	8.6 (0.34)	10.5 (0.41)	15.6 (0.61)
	W02	21.0 (0.83)	5.7 (0.22)	–	10.2 (0.40)	15.6 (0.61)
AP2R41, AP2R51	X11	±74°	±21°	±30°	±37°	±60°
	W02	±74°	±19°	–	±37°	±60°

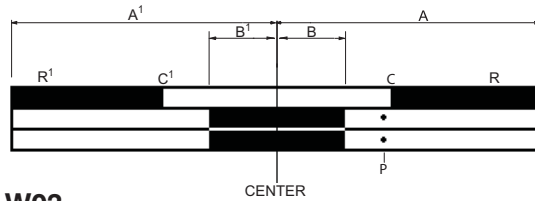
Comepi Safety Limit Switches

Bar charts for cable pulls

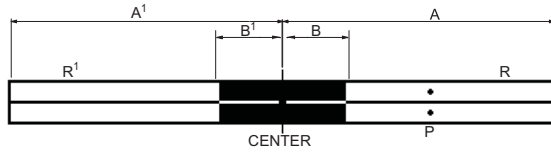
X11



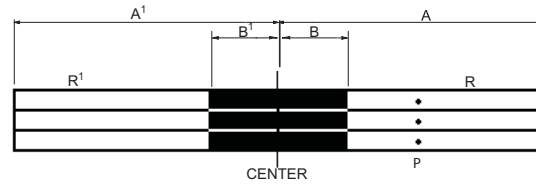
X12



W02



W03



Pull Tension from Center

- A = Max. travel of the operator in mm
- B = Tripping travel of the N.C. contact
- C = Tripping travel of the N.O. contact
- P = Point from which positive opening is assured
- R = Reset latch activates

Lax Tension from Center

- A¹ = Max. travel of the operator in mm
- B¹ = Tripping travel of the N.C. contact
- C¹ = Tripping travel of the N.O. contact
- R¹ = Reset latch activates



Part Series	Contact Configuration	Displacement Values mm(in)									
		A	B	C	P	R	Center*	A ¹	B ¹	C ¹	R ¹
SBM2K97, SBM2K99, SCM2K97, SCM2K99	X11	4 (0.16)	1.4(0.06)	2.3 (0.09)	2.6 (0.10)	3.7 (0.15)	0	6 (0.24)	1.4 (0.06)	2.4 (0.09)	4.7 (0.19)
	W02	4 (0.16)	1.2 (0.05)	–	2.4 (0.09)	3.7 (0.15)	0	6 (0.24)	1.2 (0.05)	–	4.7 (0.19)
	X12	4 (0.16)	1.5 (0.06)	3.0(0.12)	2.7 (0.11)	3.7 (0.15)	0	6 (0.24)	1.5 (0.06)	3.0 (0.12)	4.7 (0.19)
	W03	4 (0.16)	1.4 (0.06)	–	2.6 (0.10)	3.7 (0.15)	0	6 (0.24)	1.4 (0.06)	–	4.7 (0.19)
SDM2K96, SDM2K98	X11	4 (0.16)	1.4 (0.06)	2.3 (0.09)	2.6 (0.10)	3.7 (0.15)	0	6 (0.24)	1.4 (0.06)	2.4 (0.09)	4.7 (0.19)
	W02	4 (0.16)	1.2 (0.05)	–	2.4 (0.09)	3.7 (0.15)	0	6 (0.24)	1.2 (0.05)	–	4.7 (0.19)

Part Series	Contact Configuration	Force Values N									
		A	B	C	P	R	Center*	A ¹	B ¹	C ¹	R ¹
SBM2K97, SBM2K99, SCM2K97, SCM2K99	X11	300	170	190	240	260	100	0	70	55	40
	W02	300	170	–	240	260	100	0	70	–	40
	X12	300	170	190	240	260	100	0	70	55	40
	W03	300	170	–	240	260	100	0	70	–	40
SDM2K96, SDM2K98	X11	140	95	100	115	120	70	0	50	40	30
	W02	140	95	–	115	120	70	0	50	–	30

*Note: At center line, green ring on switch will be visible.

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Comepi Safety Limit Switches



KEY13



KEY14



KEY15



KEY16



KEY17



KEY18



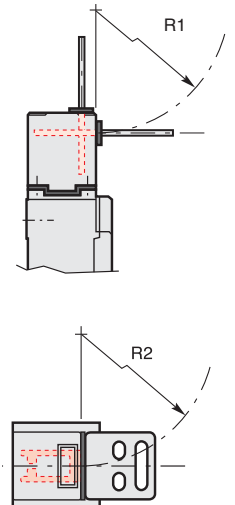
KEY19

KEY35

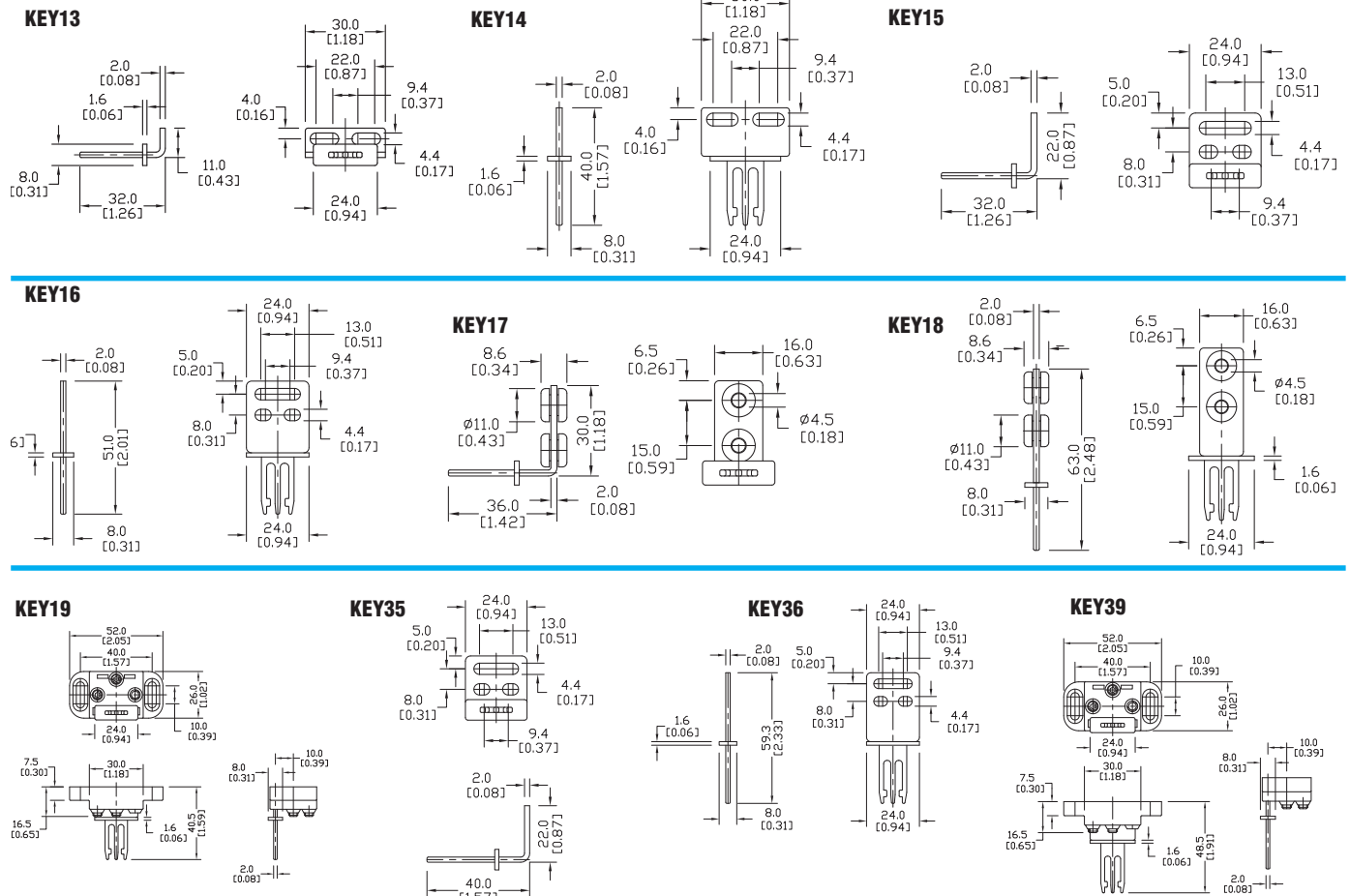
KEY36

KEY39

Safety Limit Switches Operating Keys							
Part Number	Price	Description	Weight (lbs.)	Mounting Holes Spacing mm [in]	Use With	Minimum Values mm [in]	
						R1	R2
KEY13	<--->	Actuator tongue. Key with 90-degree bent mounting tab.	0.1	22 [0.87]	SP2K and SDM2K series safety switches	400 [15.75]	400 [15.75]
KEY14	<--->	Actuator tongue. Key with straight mounting tab.	0.1	22 [0.87]		400 [15.75]	400 [15.75]
KEY15	<--->	Actuator tongue. Key with 90-degree bent mounting tab.	0.1	13 [0.51]		400 [15.75]	400 [15.75]
KEY16	<--->	Actuator tongue. Key with straight mounting tab.	0.1	13 [0.51]		400 [15.75]	400 [15.75]
KEY17	<--->	Shock-absorbing actuator tongue. Key with 90-degree bent mounting tab.	0.1	15 [0.59]		250 [9.84]	350 [13.78]
KEY18	<--->	Shock-absorbing actuator tongue. Key with straight mounting tab.	0.1	15 [0.59]		350 [13.78]	350 [13.78]
KEY19	<--->	Actuator tongue. Key with adjustable mounting tab.	0.1	40 [1.57]		180 [7.09]	200 [7.87]
KEY35	<--->	Actuator tongue. Key with 90-degree bent mounting tab.	0.1	13 [0.51]	SBM2K and SCM2K series safety switches	400 [15.75]	400 [15.75]
KEY36	<--->	Actuator tongue. Key with straight mounting tab.	0.1	13 [0.51]		400 [15.75]	400 [15.75]
KEY39	<--->	Actuator tongue. Key with adjustable mounting tab.	0.1	40 [1.57]		180 [7.09]	200 [7.87]



Dimensions mm[in]



Comepi Safety Limit Switches Accessories

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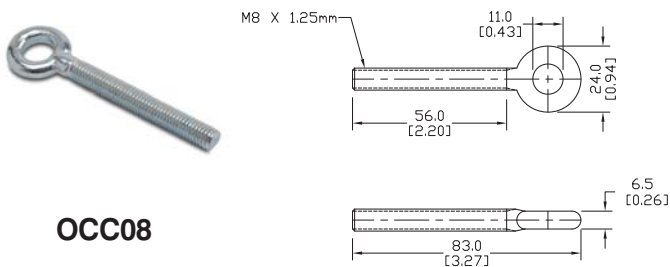
Pneumatics

Appendix

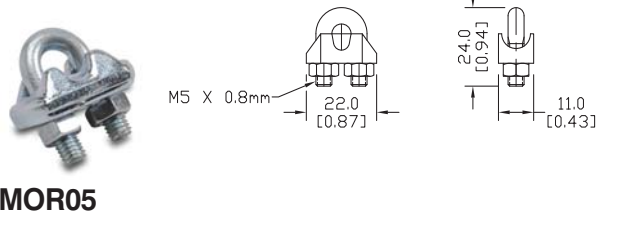
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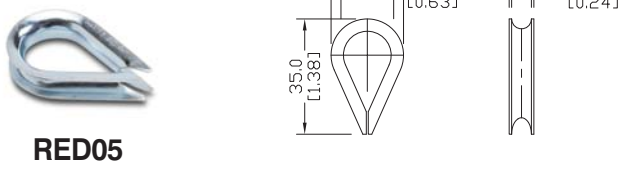
Safety Limit Switches Cable Pull Accessories			
Part Number	Price	Description	Weight (lbs.)
OCC08	<-->	Eye bolt	0.2
MOR05	<-->	Cable Clamp	0.1
RED05	<-->	Eye thimble	0.0
FUN05M015	<-->	15 meter length steel cable 5 mm diameter, Red	2.0
FUN05M025	<-->	25 meter length steel cable, 5 mm diameter, Red	3.3



OCC08



MOR05



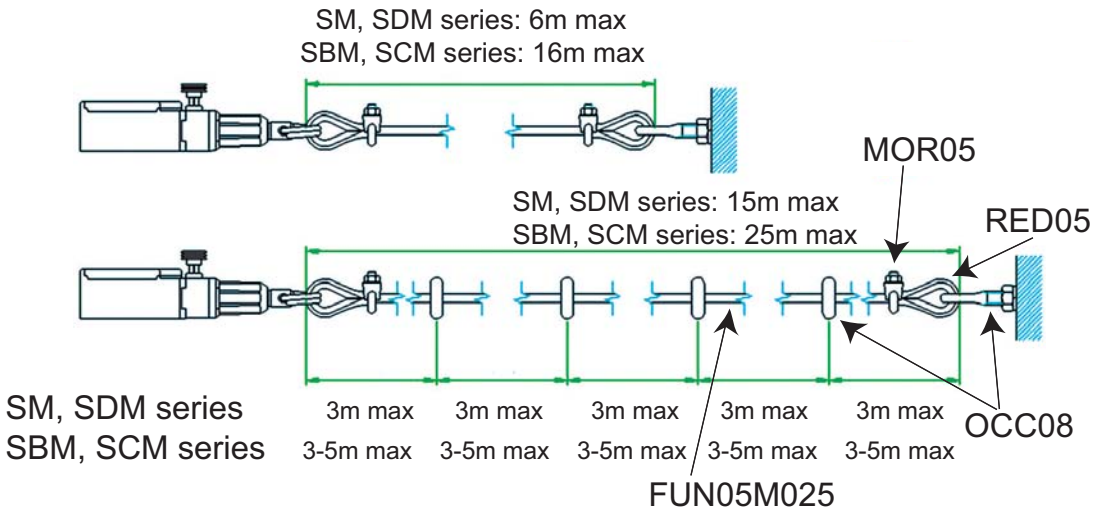
RED05



FUN05M025

All dimensions are in mm [in].

Installation example



Safety Products



Warning: Safety products sold by AutomationDirect are Safety components only. The purchaser/installer is solely responsible for the application of these components and ensuring all necessary steps have been taken to assure each application and use meets all performance and applicable safety requirements and/or local, national and/or international safety codes as required by the application. AutomationDirect cannot certify that our products used solely or in conjunction with other AutomationDirect or other vendors products will assure safety for any application.

Any person using or applying any products sold by AutomationDirect is responsible for learning the safety requirements for their individual application and applying them, and therefore assumes all risks, and accepts full and complete responsibility for the selection and suitability of the product for their respective application. AutomationDirect does not provide design or consulting services, and cannot advise whether any specific application or use of our products would ensure compliance with the safety requirements for any application.

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