

Many series and form factors for the greatest flexibility.
The classics for metalworking and automotive

MECHANICAL CAM SWITCHES

The cam switches from Balluff are used on machine tools, presses, in flexible manufacturing centers, robots, assembly and conveying devices, and in machine and equipment construction. They serve as command transmitters for automatic controls, for positioning and for end-of-travel switching.

The design principle of the devices, their variety of possible switching actions, as well as consistent quality inspection, guarantee consistently high quality and reliability.

At Balluff you can choose from nine different series and five plunger types each: Chisel, ball, roller, roller bearing and chisel with wiper plate. A large number of connection varieties is also available.

The most important benefits

- Reliable and rugged, even in harsh environments
- Flawless functionality in the event of vibrations, shock loads, temperature swings, aggressive cooling lubricants and heavy chip accumulation
- Maintenance-free, self-lubricating ram guide with plain bearing bush
- High-quality Viton seals
- Protection class IP67
- Also available with inductive switching points



Single position switch	SERIES F 60 COMPLIANT WITH DIN 43693
Plunger material	Stainless steel, contact surfaces induction-hardened
Housing material	Cast aluminum, corrosion-resistant, anodized finish
Connection type	M16 x 1.5 for cable gland or connector
Ambient temperature	-5...+85 °C
Degree of protection as per IEC 60529	IP67
Approval/Conformity	CE
Productview and installation	Page 714

Ordering example:

BNS 819-F **-60-101-** **-** **-** **-**

Plunger style

- D Chisel
- K Ball
- R Roller
- L Roller bearing
- E Chisel with wiper plate

Optional Function indicator

- FD 6...60 V AC/DC
- FE 90...250 V AC/DC

Optional Male

- S80R 5-pin, right
- S80L 5-pin, left



Single position switch	SERIES 99 AND 100
Plunger material	Stainless steel, contact surfaces induction-hardened
Housing material	Cast aluminum, corrosion-resistant, anodized finish
Connection type	Cable gland (M12 x 1.5 Series 99, M16 x 1.5 Series 100) or connector
Ambient temperature	-5...+85 °C
Degree of protection as per IEC 60529	IP 67
Approval/Conformity	CE
Productview and installation	Page 714

Ordering example:

BNS 819- [] - [] - **1** - [] - []

Serie

- 99 Series 99
- 100 Series 100

Plunger style

- D Chisel
- K Ball
- R Roller
- E Chisel with wiper plate

Switch elements

- 0 BSE 69.1
- 1 BSE 70.1
- 2 BSE 73.1
- 3 BSE 74.1

Optional Function indicator

- FC 6...24 V DC

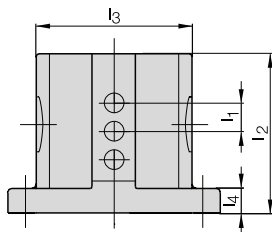
Optional Male

- S80 5-pin
 - S4 4-pin
no PE conductor
- Only with BSE 69.1 or BSE 73.1.



Multiple position switches	SERIES 100 COMPLIANT WITH DIN 43697
Plunger material	Stainless steel, contact surfaces induction-hardened
Housing material	Cast aluminum, corrosion-resistant, anodized finish
Connection type	M25 x 1.5 for cable gland or connector
Ambient temperature	-5...+85 °C
Degree of protection as per IEC 60529	IP67
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Available sizes

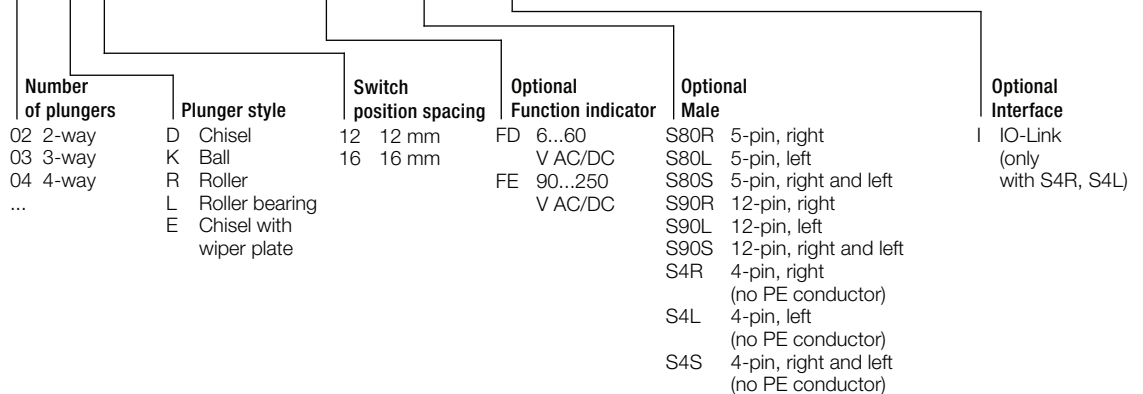


Number of plungers		2	3	4	5	6	8	10	12
Dimension l ₂ with	Dimension l ₁ = 12 mm	70	80	90	105	120	140	170	200
	Dimension l ₃	88	88	88	88	88	80	80	80
	Dimension l ₄	14	14	14	14	14	20	20	20
	Dimension l ₁ = 16 mm	70	90	105	120	140	170	200	240
Number of connectors required for standard wiring	Dimension l ₃	88	88	88	88	80	80	80	80
	Dimension l ₄	14	14	14	14	20	20	20	20
	S80 or S4 without FD/FE	1	1	2	2	2			
	S80 or S4 with FD/FE	1	2	2	3	3			
S90 without FD/FE	1	1	1	1	1	1	1	2	
	S90 with FD/FE	1	1	1	1	1	1	2	2

Dimensions in mm

Ordering example:

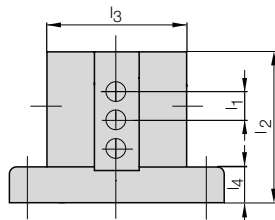
BNS 819-D - - - - - **100-10-** - - - - -





Multiple position switches	SERIES 62
Plunger material	Stainless steel, contact surfaces induction-hardened
Housing material	Cast aluminum, corrosion-resistant, anodized finish
Connection type	M20 x 1.5 for cable gland or connector
Ambient temperature	-5...+85 °C
Degree of protection as per IEC 60529	IP67
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Available sizes

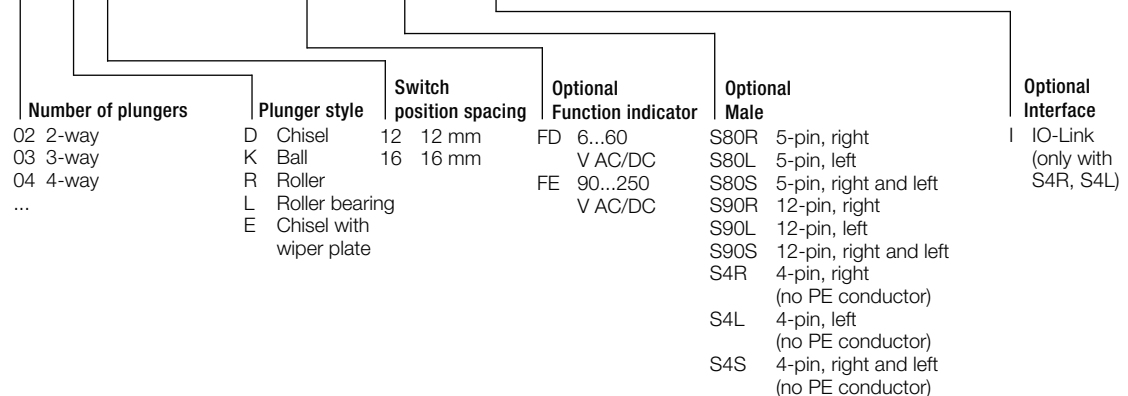


Number of plungers		2	3	4	5	6	8	10
Dimension l ₂ with	Dimension l ₁ = 12 mm	64	72	84	96	112	130	160
	Dimension l ₃	88	88	88	88	88	80	80
	Dimension l ₄	14	14	14	14	14	20	20
	Dimension l ₁ = 16 mm	64	84	96	112	130	160	192
	Dimension l ₃	88	88	88	88	80	80	80
	Dimension l ₄	14	14	14	14	20	20	20
Number of connectors	S80 or S4 without FD/FE	1	1	2	2	2		
	S80 or S4 with FD/FE	1	2	2	3	3		
	S90 without FD/FE	1	1	1	1	1	1	1
	S90 with FD/FE	1	1	1	1	1	1	2

Dimensions in mm

Ordering example:

BNS 819-D - - - - - **-62-10-** - - - - -

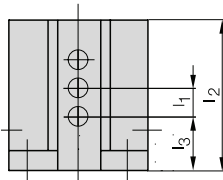




Multiple position switches	SERIES 61
Plunger material	Stainless steel, contact surfaces induction-hardened
Housing material	Cast aluminum, corrosion-resistant, anodized finish
Connection type	M20 x 1.5 for cable gland or connector
Ambient temperature	-5...+85 °C
Degree of protection as per IEC 60529	IP67
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Available sizes

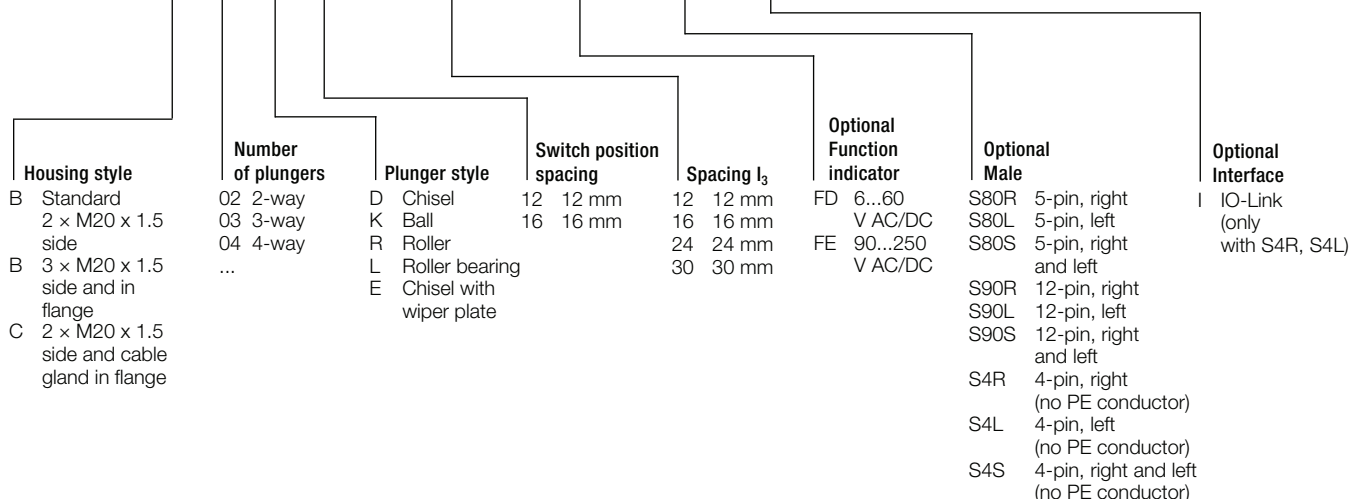
Number of plungers	Plunger-spacing Dimension	Housing B Standard		Housing B		Housing C		Number of connectors S80 or S4 without FD/FE	No. of connectors S80 or S4 with FD/FE	No. of connectors S90 without FD/FE	Number of connectors S90 with FD/FE
		Dimension	Dimension	Dimension	Dimension	Dimension	Dimension				
2	12	36	12	60	30	48	24	1	1	1	1
3	12	48	12	60	24	60	24	1	2	1	1
4	12	60	12					2	2	1	1
5	12	72	12					2	3	1	1
6	12	84	12					2	3	1	1
2	16	48	16	60	30	60	30	1	1	1	1
3	16	72	16					1	2	1	1
4	16	84	16					2	2	1	1



Dimensions in mm

Ordering example:

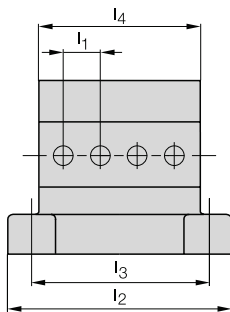
BNS 819 - [] - [] - 61 - [] - 10 - [] - [] - [] Optional





Multiple position switches	SERIES 72
Plunger material	Stainless steel, contact surfaces induction-hardened
Housing material	Cast aluminum, corrosion-resistant, anodized finish
Connection type	M25 x 1.5 for cable gland or connector
Ambient temperature	-5...+85 °C
Degree of protection as per IEC 60529	IP67
Approval/Conformity	CE
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Available sizes

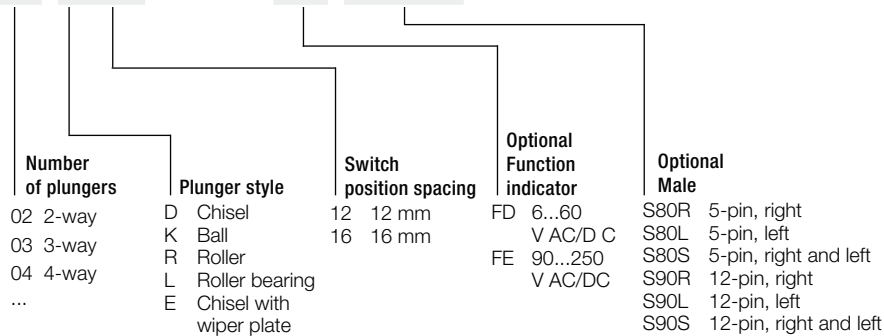


Number of plungers		2	3	4	5	6	8	10
Dimension l ₂ with Dimension l ₁ = 12 mm		84	84	100	116	132	164	180
Dimension l ₃ with Dimension l ₁ = 12 mm		66	66	82	98	114	146	162
Dimension l ₄ with Dimension l ₁ = 12 mm		54	54	68	84	100	132	148
Dimension l ₂ with Dimension l ₁ = 16 mm		84	100	116	132	148	180	212
Dimension l ₃ with Dimension l ₁ = 16 mm		66	82	98	114	130	162	194
Dimension l ₄ with Dimension l ₁ = 16 mm		54	68	84	100	116	148	180
Number of connectors	S80 without FD/FE	1	1	2	2	2		
	S80 with FD/FE	1	2	2	3	3		
	S90 without FD/FE	1	1	1	1	1	1	2
	S90 with FD/FE	1	1	1	1	1	2	2

Dimensions in mm

Ordering example:

BNS 819-B - - - - **-72-10-** - - - -

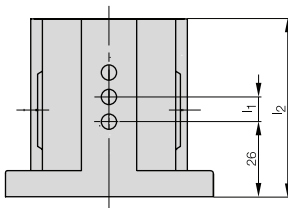




Multiple position switches	SERIES 46
Plunger material	Stainless steel, contact surfaces induction-hardened
Housing material	Cast aluminum, corrosion-resistant, anodized finish
Connection type	M16 x 1.5 for cable gland or connector
Ambient temperature	-5...+85 °C
Degree of protection as per IEC 60529	IP67
Approval/Conformity	CE
Productview and installation	Page 717

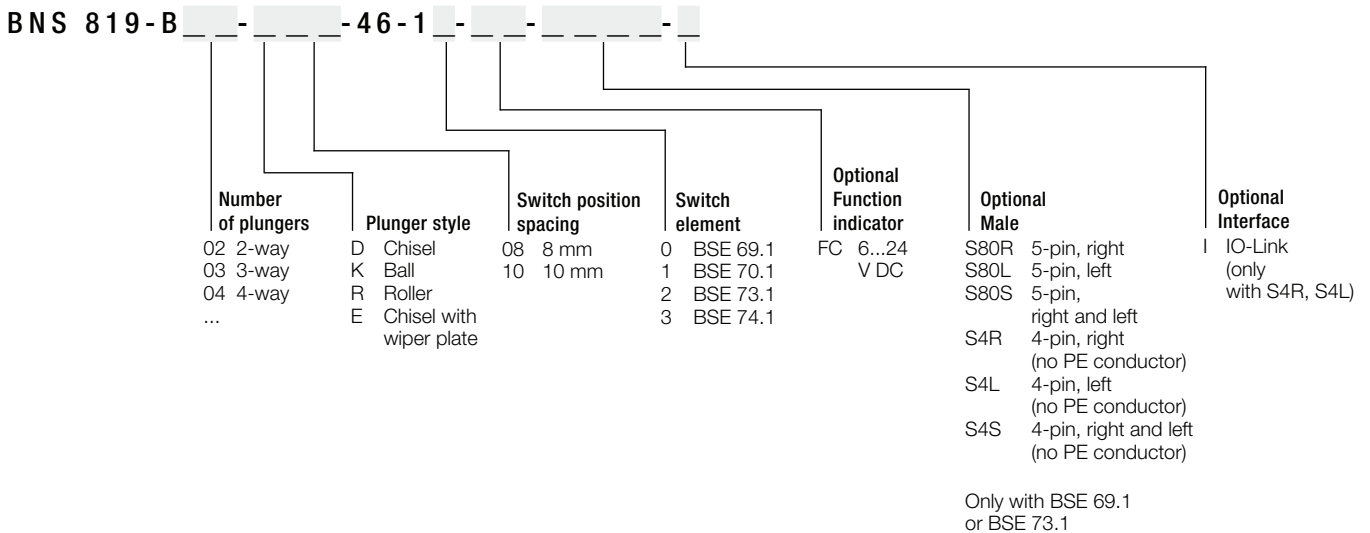
Available sizes

Number of plungers		2	3	4	5	6	8	10
Dimension I ₂ with	Dimension I ₁ = 8 mm	49	59	64	72	80	96	112
	Dimension I ₃	54	54	54	54	54	50	50
	Dimension I ₁ = 10 mm	49	59	72	80	89	112	129
	Dimension I ₃	54	54	54	54	50	50	50
Number of connectors	S80 without FC or S4	1	1	2	2	2		
	S80 with FC or S4	1	2	2	3	3		
	S4 without FC (IO-Link)	1	1	1	1	1	1	1
	S4 with FC (IO-Link)	1	1	1	1	1	1	1



Dimensions in mm

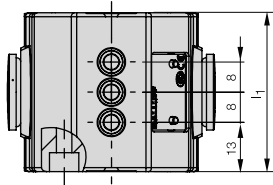
Ordering example:





Multiple position switches	SERIES 40
Plunger material	Stainless steel, contact surfaces induction-hardened
Housing material	Cast aluminum, corrosion-resistant, anodized finish
Connection type	M16 x 1.5 for cable gland or connector
Ambient temperature	-5...+85 °C
Degree of protection as per IEC 60529	IP67
Approval/Conformity	CE
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Available sizes

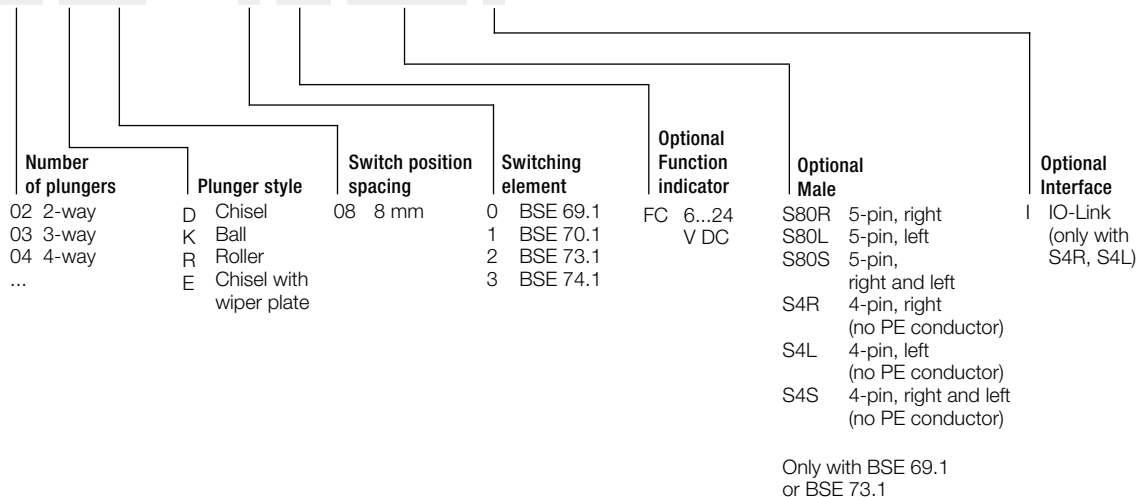


Number of plungers		2	3	4	5	6
Dimension I ₁		34	42	50	58	66
Number of connectors	S80 without FC or S4	1	1	2	2	2
	S80 with FC or S4	1	2	2		
	S4 without FC (IO-Link)	1	1	1	1	1
	S4 with FC (IO-Link)	1	1	1	1	1

Dimensions in mm

Ordering example:

BNS 819-B - - - - **-40-1** - - - -

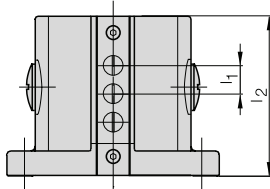




Multiple position switches with quick-change plunger block	SERIES 100 COMPLIANT WITH DIN 43697
Plunger material	Stainless steel, contact surfaces induction-hardened
Housing material	Cast aluminum, corrosion-resistant, anodized finish
Connection type	M25 x 1.5 for cable gland or connector
Ambient temperature	-5...+85 °C
Degree of protection as per IEC 60529	IP67
Approval/Conformity	CE
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Available sizes

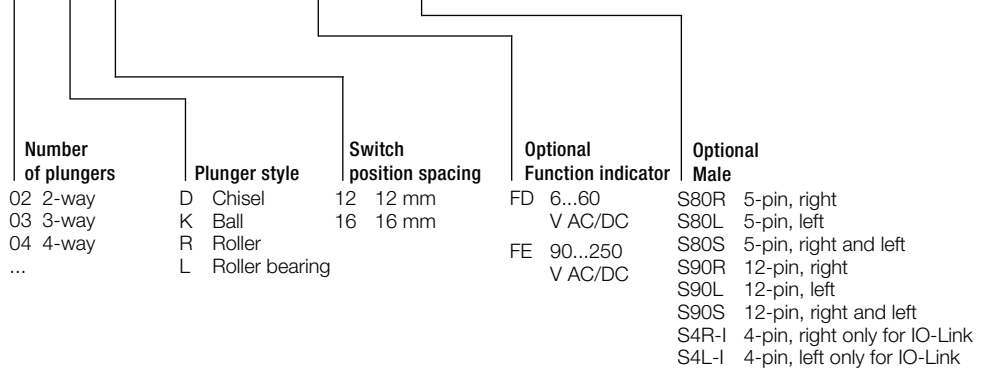
Number of plungers		2	3	4	5	6
Dimension l ₂ with	l ₁ = 12 mm	70	80	90	105	120
	l ₁ = 16 mm	70	90	105	120	
Number of connectors	S80 without FD/FE	1	1	2	2	2
	S80 with FD/FE	1	2	2	3	3
	S90 without FD/FE	1	1	1	1	1
	S90 with FD/FE	1	1	1	1	1
	S4 without FD (IO-Link)	1	1	1	1	1
	S4 with FD (IO-Link)	1	1	1	1	1



Dimensions in mm

Ordering example:

BNS 829-D - - - - **-100-10-** - - - -

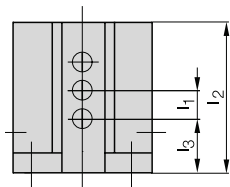




Multiple position switches with quick-change plunger block	SERIES 61
Plunger material	Stainless steel, contact surfaces induction-hardened
Housing material	Cast aluminum, corrosion-resistant, anodized finish
Connection type	M20 x 1.5 for cable gland or connector
Ambient temperature	-5...+85 °C
Degree of protection as per IEC 60529	IP67
Approval/Conformity	CE
Productview and installation	Page 718

Available sizes

Number of Plunger	Plunger-spacing Dimension		Housing B Standard Dimension		Housing B Dimension		Housing C Dimension		Number of connectors S80 without FD/FE	No. of connectors S80 with FD/FE	No. of connectors S90 with or without FD/FE	No. of connectors S4 with or without FD (IO-Link)	
	l ₁	l ₂	l ₃	l ₂	l ₃	l ₂	l ₃						
2	12	36	12	60	30	48	24	60	30	1	1	1	1
3	12	48	12	60	24	60	24			1	2	1	1
4	12	60	12							2	2	1	1
5	12	72	12							2	3	1	1
6	12	84	12							2	3	1	1
2	16	48	16	60	30	60	30			1	1	1	1
3	16	72	16							1	2	1	1
4	16	84	16							2	2	1	1



Dimensions in mm

Ordering example:

BNS 829 - [] - [] - 61 - [] - 10 - [] - []

Housing style

- B Standard
2 x M20 x 1.5 side
- B 3 x M20 x 1.5
side and in flange
- C 2 x M20 x 1.5
side and cable gland in flange

Number of plungers

- 02 2-way
- 03 3-way
- 04 4-way
- ...

Plunger style

- D Chisel
- K Ball
- R Roller
- L Roller bearing

Switch position spacing

- 12 12 mm
- 16 16 mm

Spacing l₃

- 12 12 mm
- 16 16 mm
- 24 24 mm
- 30 30 mm

Optional Function indicator

- FD 6...60
V AC/DC
- FE 90...250
V AC/DC

Optional Male

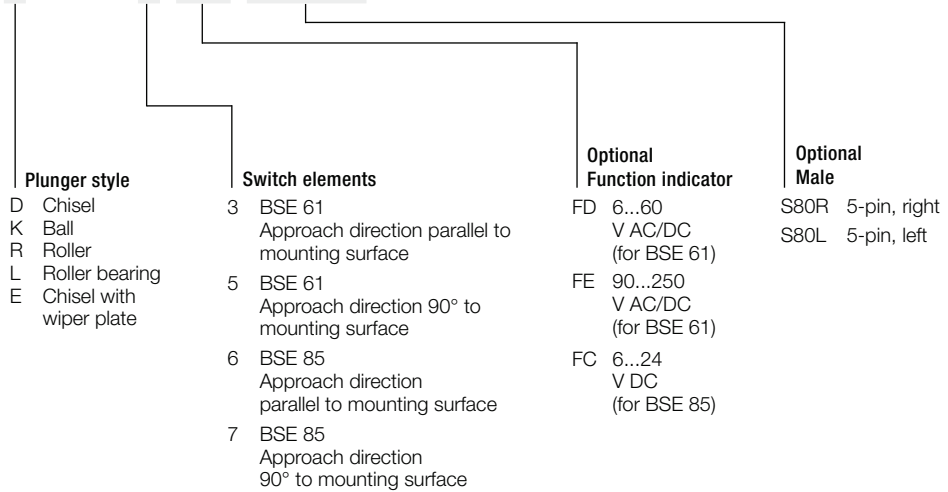
- S80R 5-pin, right
- S80L 5-pin, left
- S80S 5-pin, right and left
- S90R 12-pin, right
- S90L 12-pin, left
- S90S 12-pin, right and left
- S4R-I 4-pin, right only for IO-Link
- S4L-I 4-pin, left only for IO-Link



Position switches with safety switch positions	SERIES F 60 COMPLIANT WITH DIN 43693
Plunger material	Stainless steel, contact surfaces induction-hardened
Housing material	Cast aluminum, corrosion-resistant, anodized finish
Connection type	M16 x 1.5 for cable gland or connector
Ambient temperature	-5...+85 °C
Degree of protection as per IEC 60529	IP67
Approval/Conformity	CE
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Ordering example:

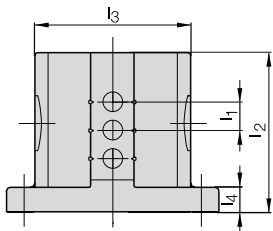
BNS 813-F **-60-18**





Multiple position limit switches with safety switch positions	SERIES 100 COMPLIANT WITH DIN 43697
Plunger material	Stainless steel, contact surfaces induction-hardened
Housing material	Cast aluminum, corrosion-resistant, anodized finish
Connection type	M25 x 1.5 for cable gland or connector
Ambient temperature	-5...+85 °C
Degree of protection as per IEC 60529	IP67
Approval/Conformity	CE
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Available sizes



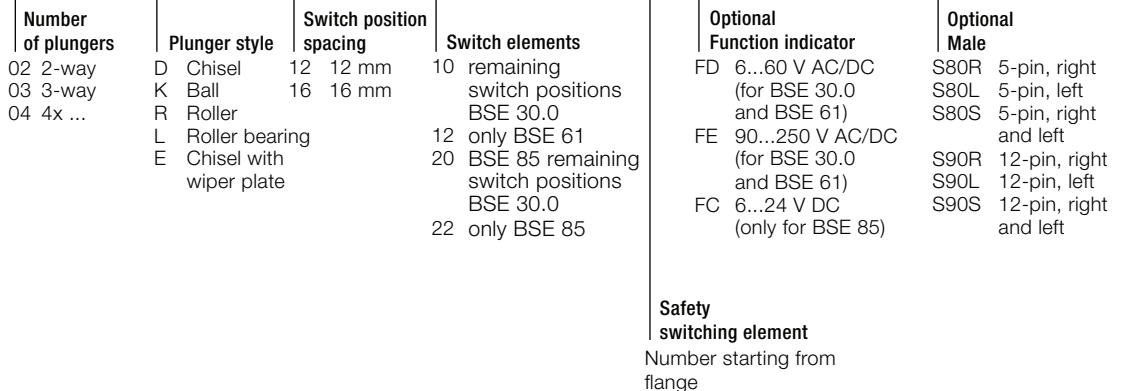
Number of plungers		2	3	4	5	6	8	10	12
Dimension l ₂ with	Dimension l ₁ = 12 mm	70	80	90	105	120	140	170	200
	Dimension l ₃	88	88	88	88	88	80	80	80
	Dimension l ₄	14	14	14	14	14	20	20	20
	Dimension l ₁ = 16 mm	70	90	105	120	140	170	200	240
	Dimension l ₃	88	88	88	88	80	80	80	80
No. of connectors *	Dimension l ₄	14	14	14	14	20	20	20	20
	S80 without FD/FE	1	1	2	2	2			
	S80 with FD/FE	1	2	2	3	3			
	S90 without FD/FE	1	1	1	1	1	1	1	2
	S90 with FD/FE	1	1	1	1	1	1	2	2

Dimensions in mm

* No. of connectors with BSE 85 on request.

Ordering example:

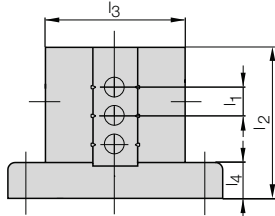
BNS 813-D - - - - **100** - - - - -





Multiple position limit switches with safety switch positions	SERIES 62
Plunger material	Stainless steel, contact surfaces induction-hardened
Housing material	Cast aluminum, corrosion-resistant, anodized finish
Connection type	M20 x 1.5 for cable gland or connector
Ambient temperature	-5...+85 °C
Degree of protection as per IEC 60529	IP67
Approval/Conformity	CE
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Available sizes



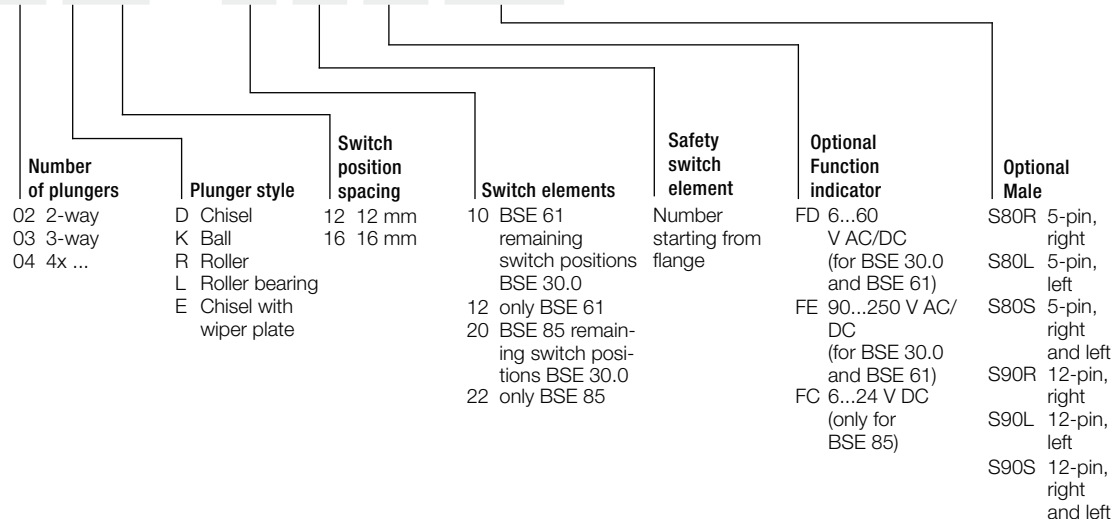
Number of plungers		2	3	4	5	6	8	10
Dimension l ₂ with	Dimension l ₁ = 12 mm	64	72	84	96	112	130	160
	Dimension l ₃	88	88	88	88	88	80	80
	Dimension l ₄	14	14	14	14	14	20	20
	Dimension l ₁ = 16 mm	64	84	96	112	130	160	192
	Dimension l ₃	88	88	88	88	80	80	80
No. of connectors *	Dimension l ₄	14	14	14	14	20	20	20
	S80 without FD/FE	1	1	2	2	2		
	S80 with FD/FE	1	2	2	3	3		
	S90 without FD/FE	1	1	1	1	1	1	2
	S90 with FD/FE	1	1	1	1	1	2	2

Dimensions in mm

* No. of connectors with BSE 85 on request.

Ordering example:

BNS 813-D - - - - 62 - - - - -

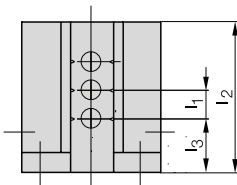




Multiple position limit switches with safety switch positions	SERIES 61
Plunger material	Stainless steel, contact surfaces induction-hardened
Housing material	Cast aluminum, corrosion-resistant, anodized finish
Connection type	M20 x 1.5 for cable gland or connector
Ambient temperature	-5...+85 °C
Degree of protection as per IEC 60529	IP67
Approval/Conformity	CE
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Available sizes

Number of Plunger	Plunger-spacing Dimension	Housing B Standard Dimension		Housing B Dimension		Housing C Dimension		No. of connectors * S80 without FD/FE	No. of connectors * S80 with FD/FE	No. of connectors * S90 without FD/FE	No. of connectors * S90 with FD/FE
		l ₂	l ₃	l ₂	l ₃	l ₂	l ₃				
2	12	36	12	60	30	48	24	1	1	1	1
3	12	48	12	60	24	60	24	1	2	1	1
4	12	60	12					2	2	1	1
5	12	72	12					2	3	1	1
6	12	84	12					2	3	1	1
2	16	48	16	60	30	60	30	1	1	1	1
3	16	72	16					1	2	1	1
4	16	84	16					2	2	1	1

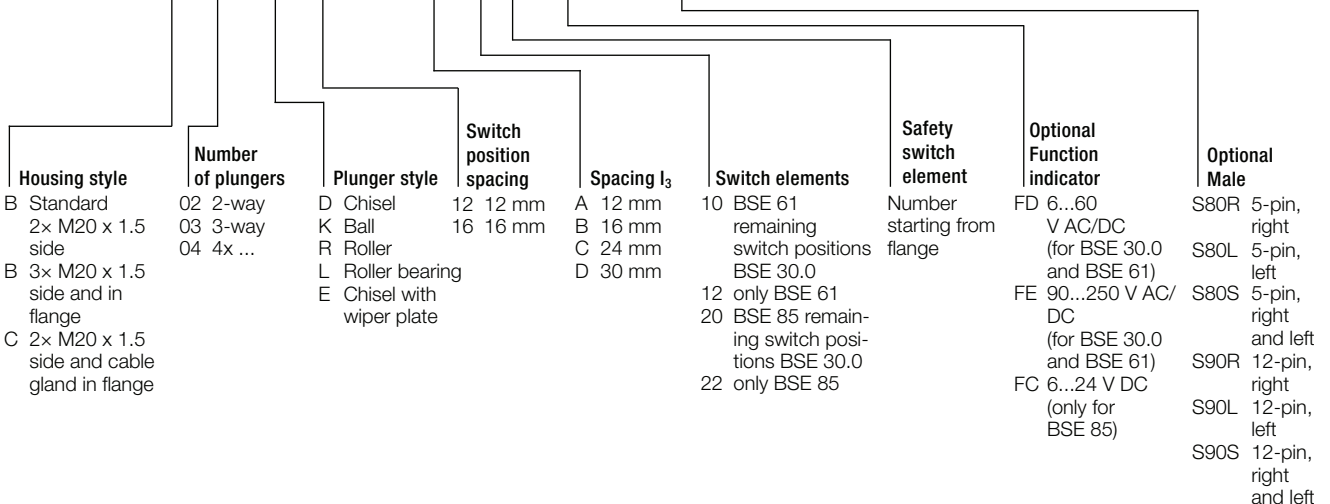


Dimensions in mm

* No. of connectors with BSE 85 on request.

Ordering example:

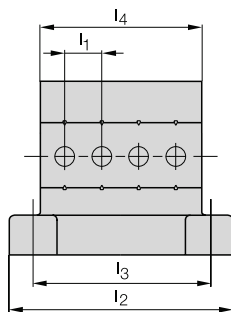
BNS 813- - - - 61 - - - - -





Multiple position limit switches with safety switch positions	SERIES 72
Plunger material	Stainless steel, contact surfaces induction-hardened
Housing material	Cast aluminum, corrosion-resistant, anodized finish
Connection type	M25 x 1.5 for cable gland or connector
Ambient temperature	-5...+85 °C
Degree of protection as per IEC 60529	IP67
Approval/Conformity	CE
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Available sizes



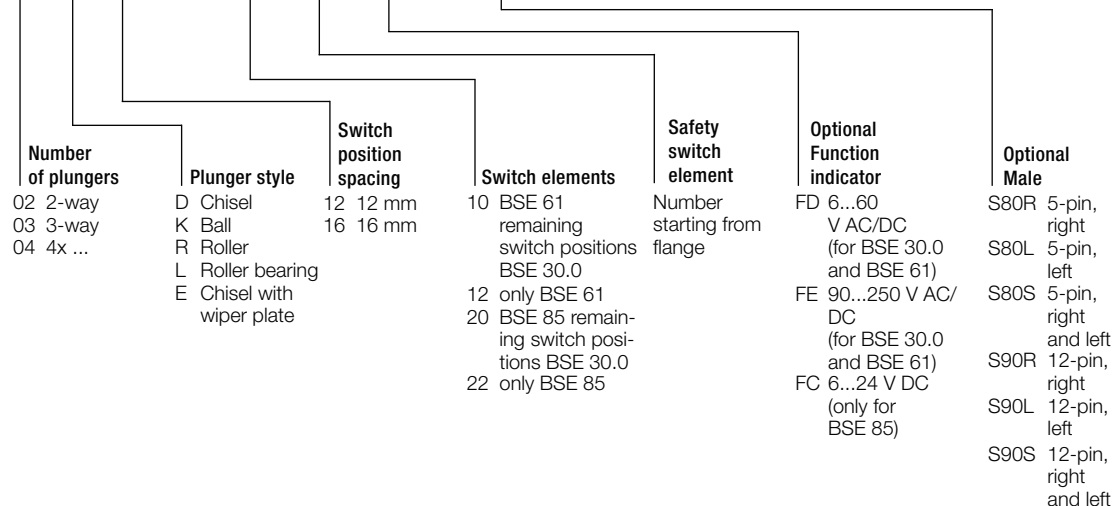
Number of plungers		2	3	4	5	6	8	10
Dimension I ₂ with I ₁ = 12 mm		84	84	100	116	132	164	180
Dimension I ₃ with I ₁ = 12 mm		66	66	82	98	114	146	162
Dimension I ₄ with I ₁ = 12 mm		54	54	68	84	100	132	148
Dimension I ₂ with I ₁ = 16 mm		84	100	116	132	148	180	212
Dimension I ₃ with I ₁ = 16 mm		66	82	98	114	130	162	194
Dimension I ₄ with I ₁ = 16 mm		54	68	84	100	116	148	180
No. of connectors *	S80 without FD/FE	1	1	2	2	2		
	S80 with FD/FE	1	2	2	3	3		
	S90 without FD/FE	1	1	1	1	1	1	1
	S90 with FD/FE	1	1	1	1	1	1	2

Dimensions in mm

* No. of connectors with BSE 85 on request.

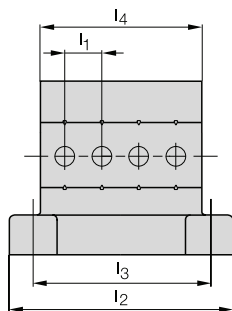
Ordering example:

BNS 813-B - - - - 72 - - - - -





Multiple position limit switches with safety switch positions and quick-change plunger block	SERIES 100 COMPLIANT WITH DIN 43697
Plunger material	Stainless steel, contact surfaces induction-hardened
Housing material	Cast aluminum, corrosion-resistant, anodized finish
Connection type	M25 x 1.5 for cable gland or connector
Ambient temperature	-5...+85 °C
Degree of protection as per IEC 60529	IP67
Approval/Conformity	CE
Productview and installation	Page 721



Available sizes

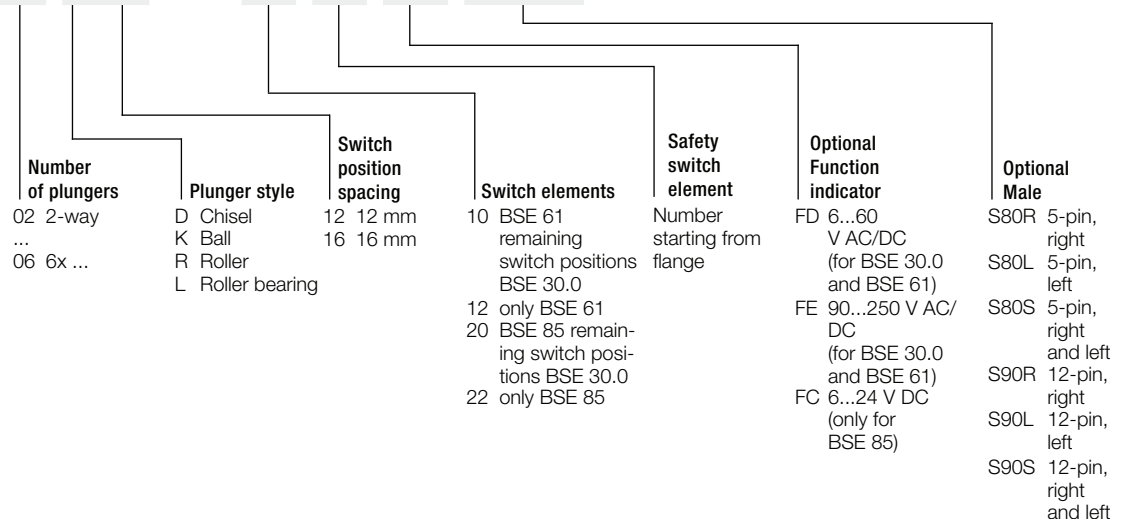
Number of plungers		2	3	4	5	6
Dimension l_2 with	$l_1 = 12 \text{ mm}$	70	80	90	105	120
	$l_1 = 16 \text{ mm}$	70	90	105	120	
No. of connectors *	S80 without FD/FE	1	1	2	2	2
	S80 with FD/FE	1	2	2	3	3
	S90 without FD/FE	1	1	1	1	1
	S90 with FD/FE	1	1	1	1	1

Dimensions in mm

* No. of connectors with BSE 85 on request.

Ordering example:

BNS 823-D - - - - - **100** - - - - -

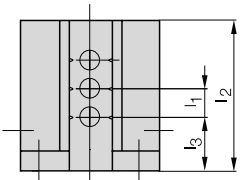




Multiple position limit switches with safety switch positions	SERIES 61
Plunger material	Stainless steel, contact surfaces induction-hardened
Housing material	Cast aluminum, corrosion-resistant, anodized finish
Connection type	M20 x 1.5 for cable gland or connector
Ambient temperature	-5...+85 °C
Degree of protection as per IEC 60529	IP67
Approval/Conformity	CE
Productview and installation	Page 722

Available sizes

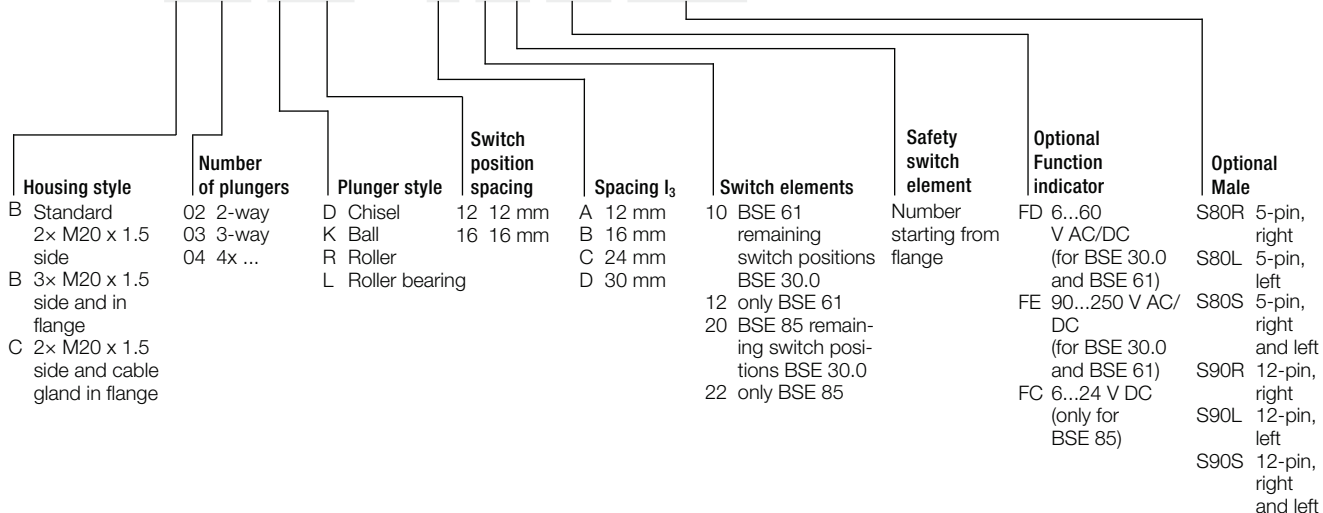
Number of Plunger	Plunger-spacing Dimension	Housing B Standard		Housing B		Housing C		No. of connectors * S80 without FD/FE	No. of connectors * S80 with FD/FE	No. of connectors * S90 without FD/FE	No. of connectors * S90 with FD/FE
		l ₂	l ₃	l ₂	l ₃	l ₂	l ₃				
2	12	36	12	60	30	48	24	1	1	1	1
3	12	48	12	60	24	60	24	1	2	1	1
4	12	60	12					2	2	1	1
5	12	72	12					2	3	1	1
6	12	84	12					2	3	1	1
2	16	48	16	60	30	60	30	1	1	1	1
3	16	72	16					1	2	1	1
4	16	84	16					2	2	1	1



Dimensions in mm
* No. of connectors with BSE 85 on request.

Ordering example:

BNS 823- - - - -61- - - - -

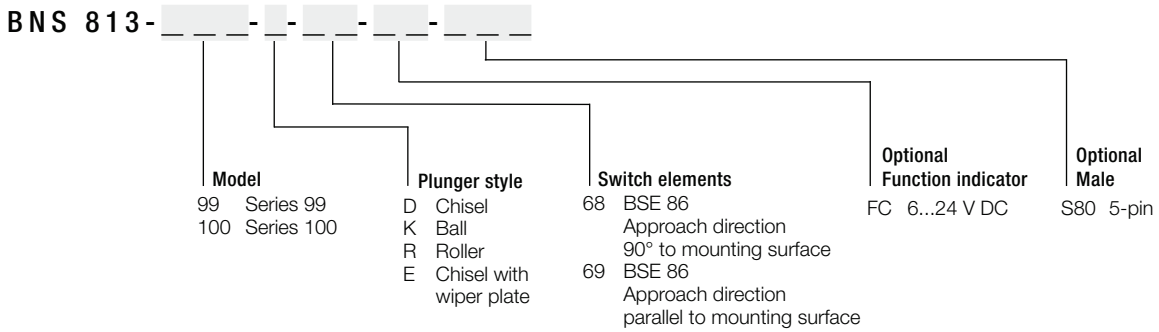


Sensors
RFID
Machine Vision and Optical Identification
Human Machine Interfaces
Safety
Industrial Networking
Software and System Solutions
Power Supply
Connectivity
Accessories



Position switches with positive opening	SERIES 99 AND 100
Plunger material	Stainless steel, contact surfaces induction-hardened
Housing material	Cast aluminum, corrosion-resistant, anodized finish
Connection type	Cable gland (M12 x 1.5 Series 99, M16 x 1.5 Series 100) or connector
Ambient temperature	-5...+85 °C
Degree of protection as per IEC 60529	IP67
Approval/Conformity	CE
Productview and installation	Page 722

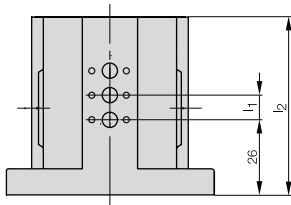
Ordering example:





Multiple position limit switches with positive opening	SERIES 46
Plunger material	Stainless steel, contact surfaces induction-hardened
Housing material	Cast aluminum, corrosion-resistant, anodized finish
Connection type	M16 x 1.5 for cable gland or connector
Ambient temperature	-5...+85 °C
Degree of protection as per IEC 60529	IP67
Approval/Conformity	CE
Productview and installation	Page 723

Available sizes

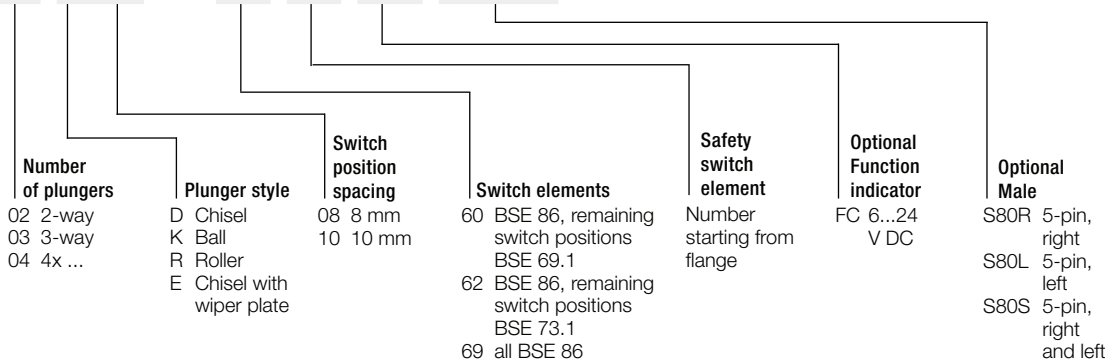


Number of plungers		2	3	4	5	6	8	10
Dimension I ₂ with	Dimension I ₁ = 8 mm	49	59	64	72	80	96	112
	Dimension I ₃	54	54	54	54	54	50	50
	Dimension I ₁ = 10 mm	49	59	72	80	89	112	129
	Dimension I ₃	54	54	54	54	50	50	50
Number of connectors	S80 without FC	1	1	2	2	2	3	3
	S80 with FC	1	2	2	3	3		

Dimensions in mm
Size 12-x with 8 mm spacing on request.

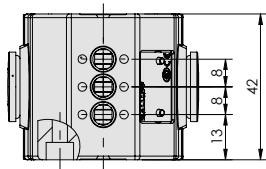
Ordering example:

BNS 813-B [] - [] - **46** - [] - [] - [] - []





Position switch with positive opening	SERIES 40
Plunger material	Stainless steel, contact surfaces induction-hardened
Housing material	Cast aluminum, corrosion-resistant, anodized finish
Connection type	M16 x 1.5 for cable gland or connector
Ambient temperature	-5...+85 °C
Degree of protection as per IEC 60529	IP67
Approval/Conformity	CE
Productview and installation	Page 723



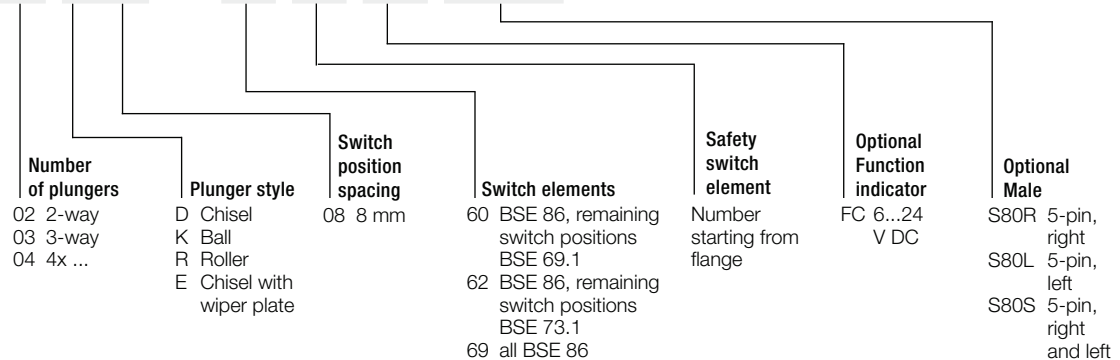
Available sizes

Number of plungers	2	3	4	5	6
Dimension I ₁	34	42	50	58	66
S80 without FC	1	1	2	2	2
S80 with FC	1	2	2		

Dimensions in mm

Ordering example:

BNS 813-B - - - - **40** - - - - -

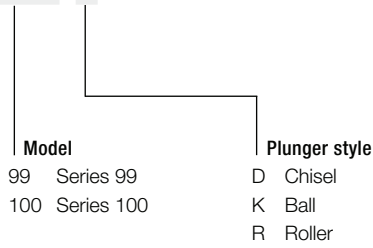


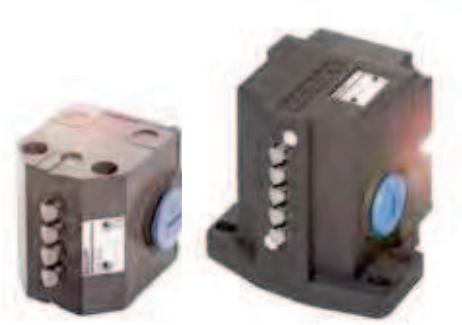


High-temperature position switches	SERIES 99 AND 100
Plunger material	Stainless steel, contact surfaces induction-hardened
Housing material	Cast aluminum, corrosion-resistant, anodized finish
Connection type	M12 x 1.5 or M16 x 1.5 for cable gland
Ambient temperature	-5...+150 °C (-5...+180 °C 10 h/day)
Degree of protection as per IEC 60529	IP67
Approval/Conformity	CE
Productview and installation	Page 724

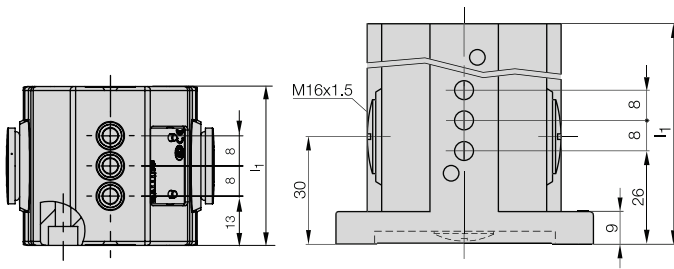
Ordering example:

BNS 819- - - -15





High-temperature position switches	SERIES 46 AND 40
Plunger material	Stainless steel, contact surfaces induction-hardened
Housing material	Cast aluminum, corrosion-resistant, anodized finish
Connection type	M12 x 1.5 or M16 x 1.5 for cable gland
Ambient temperature	-5...+150 °C (-5...+180 °C 10 h/day)
Degree of protection as per IEC 60529	IP67
Approval/Conformity	CE
Productview and installation	Page 724



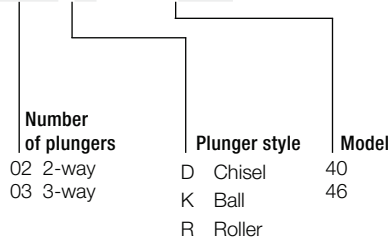
Available sizes

Number of plungers	2	3
Dimension I ₁	49	59

Dimensions in mm

Ordering example:

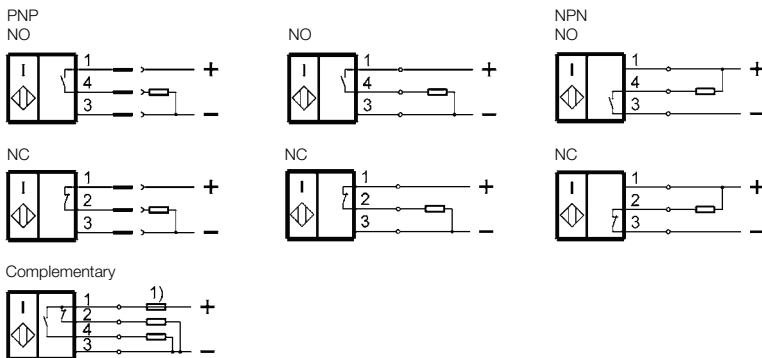
BNS 819-B - 08 - 15





PNP NO	BES01FE BES 516-346-H2-Y-S4	BES01FF BES 516-346-H2-Y-S49	
PNP NC	BES01EW BES 516-341-H2-Y-S4		
PNP changeover			
NPN NO			
NPN NC			
Dimension	54 x 22 x 48 mm	54 x 22 x 48 mm	
Design	block style	block style	
Installation	Flush	Flush	
Range	5 mm	5 mm	
Switching frequency	500 Hz	500 Hz	
Housing material	Aluminum	Aluminum	
Sensing surface, material	PA 12	PA 12	
Connection	Connector, M12x1 connector, 4-pin	Connector, M12x1 connector, 4-pin	
Operating voltage U_b	10...30 VDC	10...30 VDC	
Ambient temperature	-25...+70 °C	-25...+70 °C	
Degree of protection	IP67	IP67	
Approval/Conformity	CE, EAC	CE, EAC	
Productview and installation	Page 725	Page 725	

Wiring diagrams





BES01FC BES 516-346-H2-Y		
BES01EU BES 516-341-H2-Y		
	BES017M BES 516-161-H3-L	
BES01ZK BES 516-344-H2-Y		
BES01ET BES 516-340-H2-Y		
54 x 22 x 48 mm	74 x 28 x 60.5 mm	
block style	block style	
Flush	Flush	
5 mm	7 mm	
500 Hz	300 Hz	
Aluminum	Aluminum	
PA 12	PA 12	
Screw terminal	Screw terminal	
10...30 VDC	10...30 VDC	
-25...+70 °C	-25...+70 °C	
IP67	IP67	
CE, EAC	CE, EAC	
Page 725	Page 725	

Sensors

RFID

Machine Vision and
Optical Identification

Human Machine
Interfaces

Safety

Industrial Networking

Software and
System Solutions

Power Supply

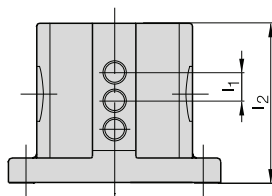
Connectivity

Accessories



Inductive multiple position switches	SERIES 602-11 COMPLIANT WITH DIN 43697
Housing material	Cast aluminum, corrosion-resistant, anodized finish
Connection type	M25 x 1.5 for cable gland or connector
Ambient temperature	-25...+70 °C
Degree of protection as per IEC 60529	IP67
Approval/Conformity	CE
Productview and installation	Page 725

Available sizes



Number of plungers		2	3	4	5	6	8	10	12
Dimension l ₂ with	Dimension l ₁ = 12 mm	70	80	90	105	120	140	170	200
	Dimension l ₄	88	88	88	88	88	80	80	80
	Dimension l ₅	14	14	14	14	14	20	20	20
	Dimension l ₁ = 16 mm	70	90	105	120	140	170	200	240
	Dimension l ₄	88	88	88	88	80	80	80	80
	Dimension l ₅ !	14	14	14	14	20	20	20	20
Number of connectors	S80	on request							
	S90	on request							
Dimension l ₃	4 mm for inductive switch elements with sensing head 10 mm								
	2 mm for inductive switch elements with sensing head 15.5 mm								

Dimensions in mm

Ordering example:

BNS 816-B - - - - **602-11-** - - -

Number of plungers
02 2-way
03 3-way
04 4x ...

Code for switch elements
(see table Seite 35)

Switch position spacing
12 12 mm
16 16 mm

Optional Male
S80R 5-pin, right
S80L 5-pin, left
S80S 5-pin, right and left
S90R 12-pin, right
S90L 12-pin, left
S90S 12-pin, right and left



Inductive multiple position switches	BNS 816-B - - - - -610/611/612/613-11- - - -
Housing material	Cast aluminum, corrosion-resistant, anodized finish
Connection type	M20 x 1.5 for cable gland or connector
Ambient temperature	-25...+70 °C
Degree of protection as per IEC 60529	IP67
Approval/Conformity	CE
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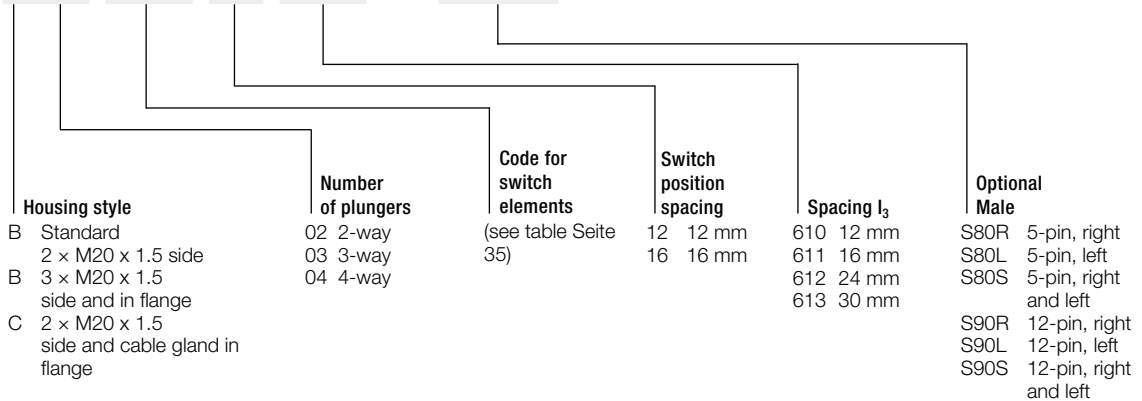
Available sizes

Number of switch-positions	Number of Male S80/S90	Switch-position-spacing Dimension	Series 610 Housing B Standard Dimension		Series 611 Housing B Standard Dimension		Series 612 Housing B Dimension		Series 612 Housing C Dimension		Series 613 Housing B Dimension		Series 613 Housing C Dimension	
			l ₂	l ₃	l ₂	l ₃	l ₂	l ₃	l ₂	l ₃	l ₂	l ₃	l ₂	l ₃
2	on request	12	36	12					48	24	60	30		
3		12	48	12			60	24	60	24				
4		12	60	12										
5		12	72	12										
6		12	84	12										
2			16			48	16					60	30	
3		16			72	16								
4		16			84	16								

Dimensions in mm
 Dimension l₄ = 4 mm for inductive switch elements with sensing head Ø 10 mm
 Dimension l₄ = 2 mm for inductive switch elements with sensing head Ø15.5 mm

Ordering example:

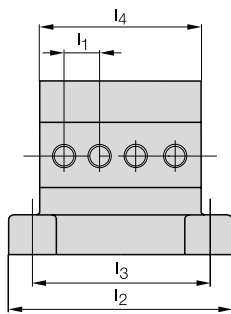
BNS 816- - - - -11- - - -





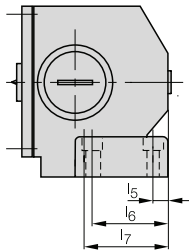
Inductive multiple position switches	SERIES 605-11
Housing material	Cast aluminum, corrosion-resistant, anodized finish
Connection type	M25 x 1.5 for cable gland or connector
Ambient temperature	-25...+70 °C
Degree of protection as per IEC 60529	IP67
Approval/Conformity	CE
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Available sizes



Number of switching positions		2	3	4	5	6	7	8	10	12
Dimension l ₂ with	Dimension l ₁ = 12 mm	84	84	100	116	132	148	164	180	
Dimension l ₃ with	Dimension l ₁ = 12 mm	66	66	82	98	114	130	146	162	
Dimension l ₄ with	Dimension l ₁ = 12 mm	54	54	68	84	100	164	132	148	
Dimension l ₂ with	Dimension l ₁ = 16 mm	84	100	116	132	148	146	180	212	224
Dimension l ₃ with	Dimension l ₁ = 16 mm	66	82	98	114	130	132	162	194	226
Dimension l ₄ with	Dimension l ₁ = 16 mm	54	68	84	100	116		148	180	212
Number of connectors	S80	on request								
	S90	on request								

Dimensions in mm



Dimensions when using inductive switch elements with sensing head Ø 10 mm		Dimensions when using inductive switch elements with sensing head Ø 15.5 mm	
Dimension l ₂	10 mm	Dimension l ₂	8 mm
Dimension l ₃	40 mm	Dimension l ₃	38 mm
Dimension l ₄	43.5 mm	Dimension l ₄	41.5 mm

Dimensions in mm

Ordering example:

BNS 816-B - - - - **- 605-11-** - - - -

Number of plungers
02 2-way
03 3-way
04 4x ...

Code for switch elements
(see table 7215)

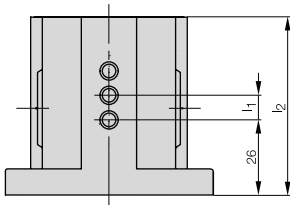
Switch position spacing
12 12 mm
16 16 mm

Optional Male
S80R 5-pin, right
S80L 5-pin, left
S80S 5-pin, right and left
S90R 12-pin, right
S90L 12-pin, left
S90S 12-pin, right and left



Inductive multiple position switches	SERIES 603-11
Housing material	Cast aluminum, corrosion-resistant, anodized finish
Connection type	M16 x 1.5 for cable gland or connector
Ambient temperature	-25...+70 °C
Degree of protection as per IEC 60529	IP67
Approval/Conformity	CE
Productview and installation	Page 727

Available sizes

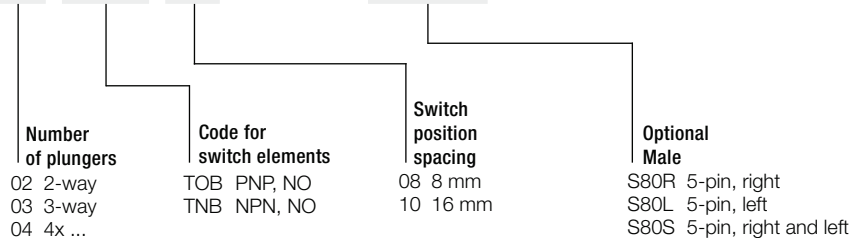


Number of switching positions		2	3	4	5	6	8	10
Dimension l_2 with	Dimension $l_1 = 8$ mm	49	59	64	72	80	96	112
	Dimension $l_3 =$	54	54	54	54	54	50	50
	Dimension $l_1 = 10$ mm	49	59	72	80	89	112	129
	Dimension $l_3 =$	54	54	54	54	50	50	50
Number of connectors	S80 on request							

Dimensions in mm
Size 12-x with 8 mm spacing on request.

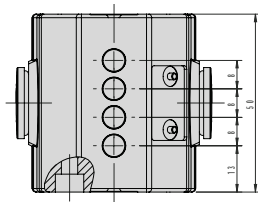
Ordering example:

BNS 816-B - - - - **-603-11-** - - - -





Inductive multiple position switches	SERIES 650-11
Housing material	Cast aluminum, corrosion-resistant, anodized finish
Connection type	M16 x 1.5 for cable gland or connector
Ambient temperature	-25...+70 °C
Degree of protection as per IEC 60529	IP67
Approval/Conformity	CE
Productview and installation	Page 727



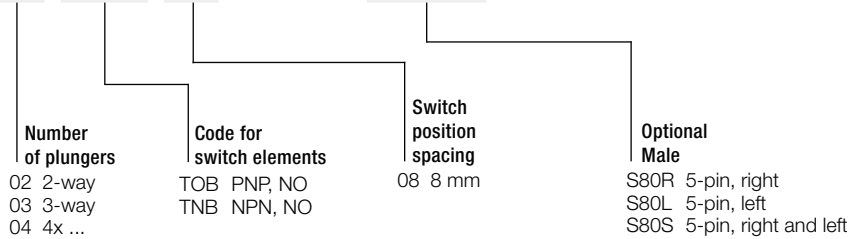
Available sizes

Number of switching positions	2	3	4	5	6
Dimension I ₁	34	42	50	58	66
No. of connectors S80 on request					

Dimensions in mm

Ordering example:

BNS 816-B - - - - **-650-11-** - - - -



Inductive switch elements with sensing head Ø 10 mm, for use with switch position spacing 12 and 16 mm

Code	Order code for spare switch elements	Electrical version	Rated-switching distance s_n	Assured switching distance s_a
PA	BES 517-110	PNP, changeover, 10...60 V DC, short-circuit protected	2 mm	0...1.6 mm
NA	BES 517-108	NPN, changeover, 10...60 V DC, short-circuit protected	2 mm	0...1.6 mm
WS	BES 517-410	NO, up to 250 V AC	2 mm	0...1.6 mm
WO	BES 517-421	NC, up to 250 V AC	2 mm	0...1.6 mm
KHG	BES 517-560-H	2-wire, NO, 10...55 V DC, short-circuit protected	2 mm	0...1.6 mm
KHH	BES 517-561-H	2-wire, NC, 10...55 V DC, short-circuit protected	2 mm	0...1.6 mm
NG	BES 516-314-N	2-wire, NAMUR, 7.7...9 V DC	2 mm	0...1.6 mm

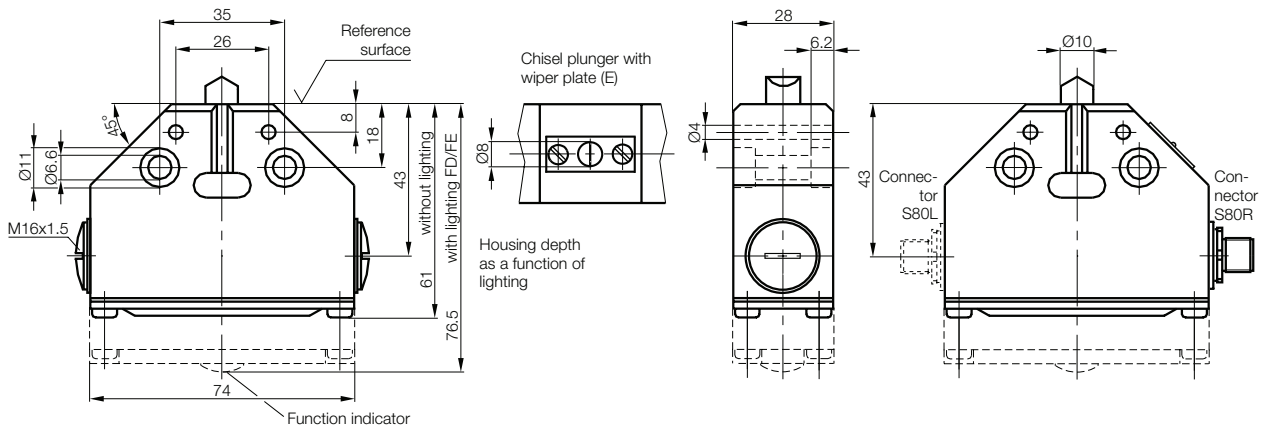
Inductive switch elements with sensing head Ø 15.5 mm, for use with switch position spacing 16 mm

Code	Order code for spare switch elements	Electrical version	Rated-switching distance s_n	Assured switching distance s_a
THA	BES 517-142-Y	PNP, changeover, 10...30 V DC, short-circuit protected	5 mm	0...4 mm
EJA	BES 517-463	NO, up to 250 V AC	5 mm	0...4 mm
AAA	BES 517-464	NC, up to 250 V AC	5 mm	0...4 mm

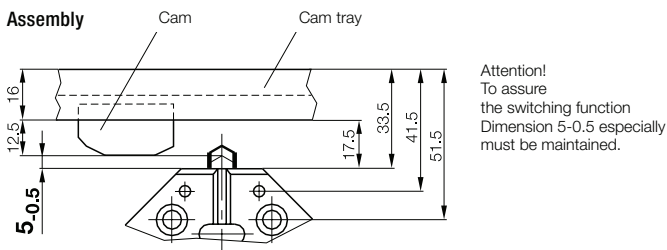
Hybrid switch element with mechanical plunger and inductive processing

Code	Order code for spare switch elements	Electrical version	Rated-switching distance s_n	Assured switching distance s_a
DH	BES 516-110-D	PNP, changeover, 10...30 V DC	More information on request!	

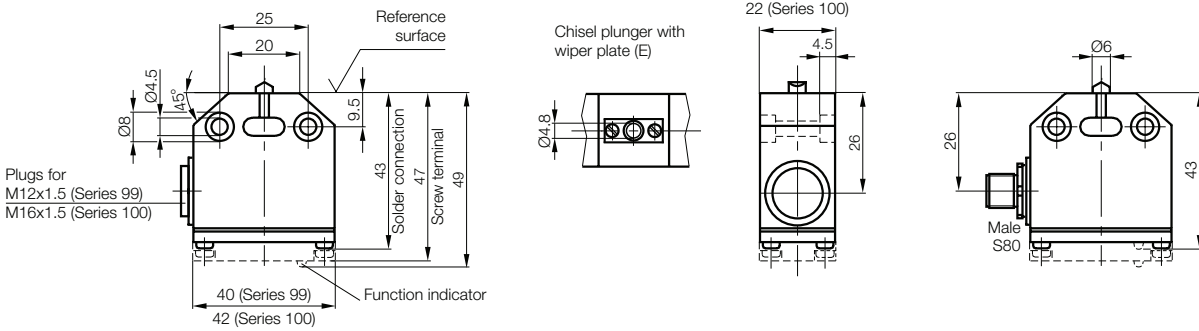
Position switch Series F60 compliant with DIN 43693



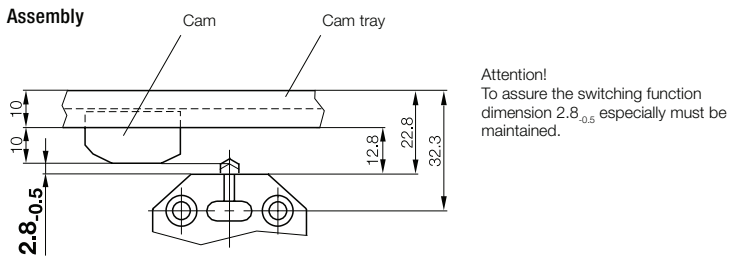
Assembly



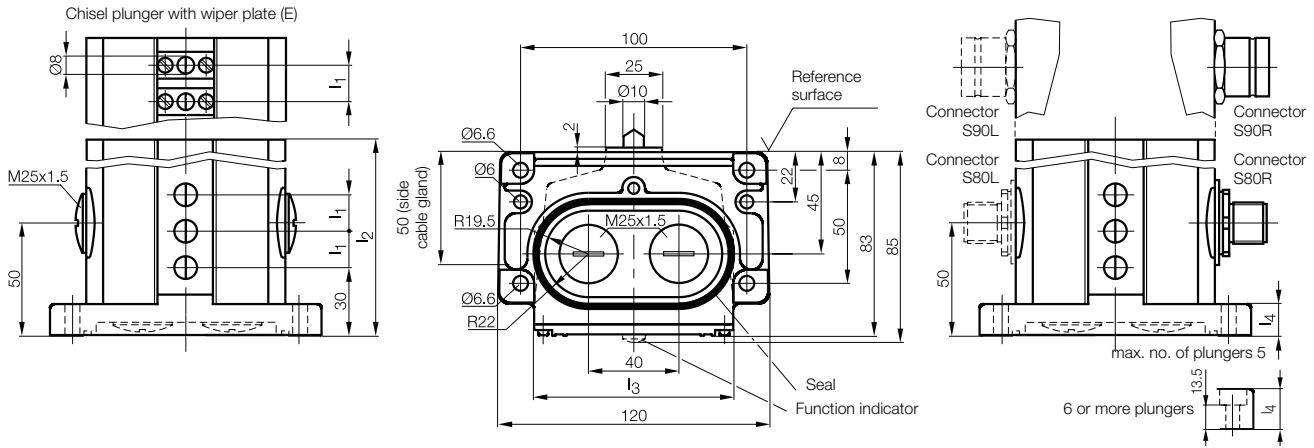
Position switch Series 99 and 100



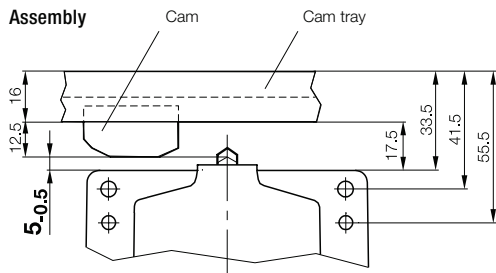
Assembly



Multiple position switches 100 compliant with DIN 43697

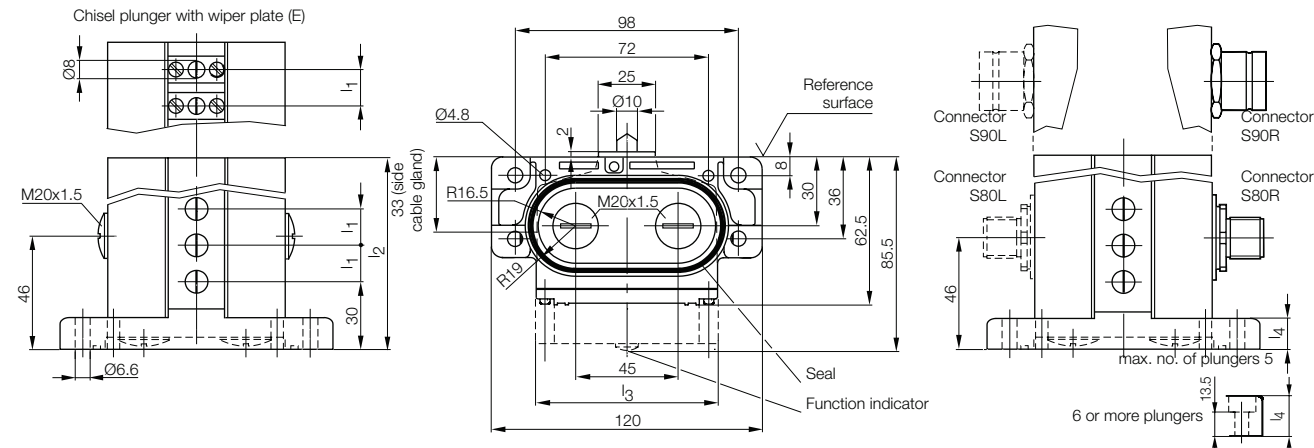


Assembly

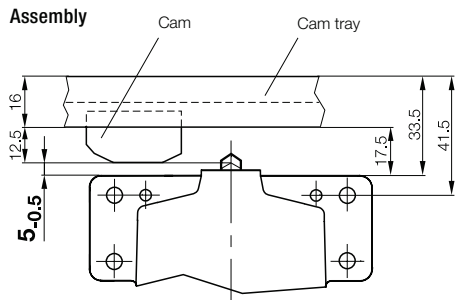


Attention!
To assure the switching function dimension 5_{-0.5} especially must be maintained.

Series 62 multiple position switch

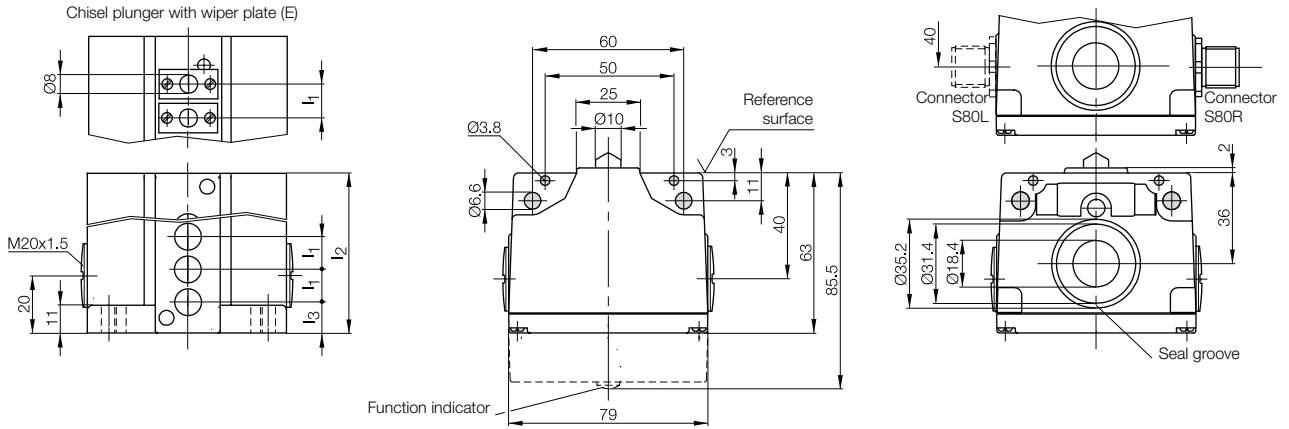


Assembly

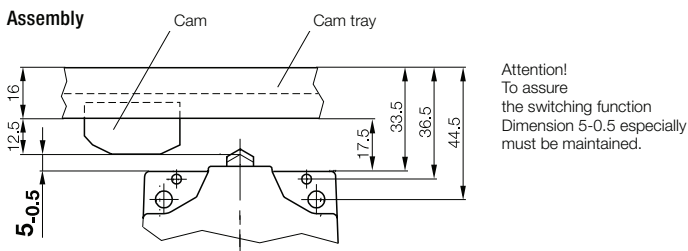


Attention!
To assure the switching function Dimension 5-0.5 especially must be maintained.

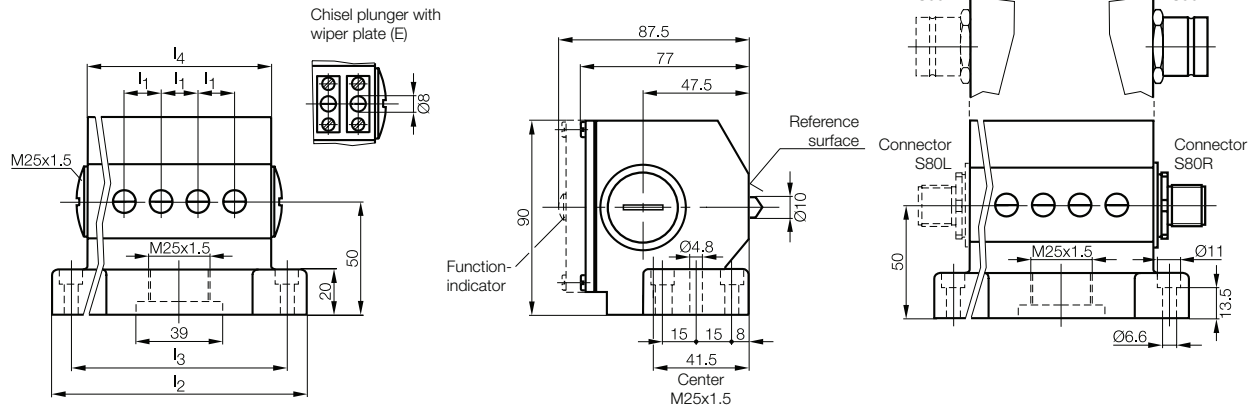
Series 61 multiple position switch



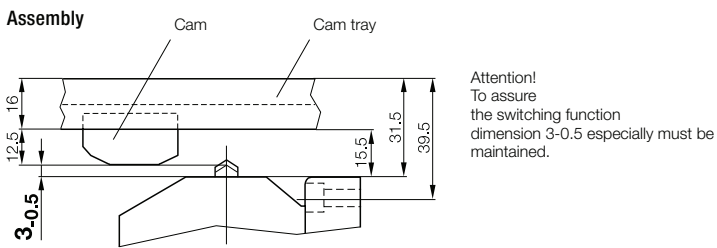
Assembly



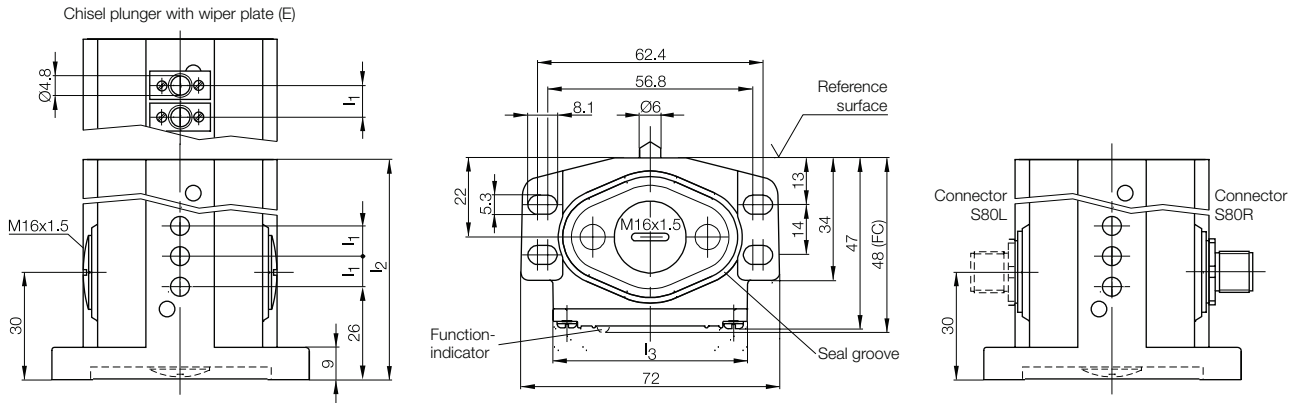
Series 72 multiple position switch



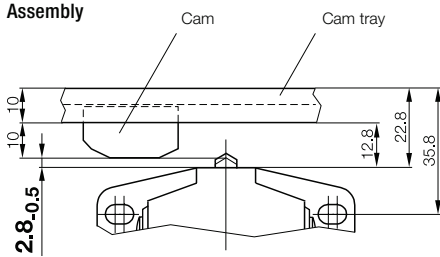
Assembly



Series 46 multiple position switch



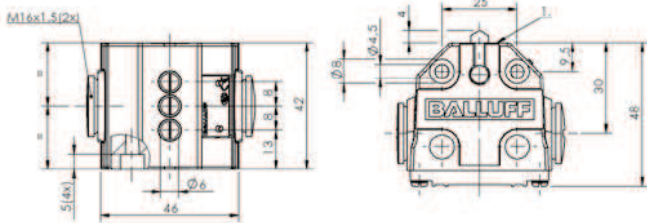
Assembly



Attention!
To assure the switching function dimension 2.8-0.5 especially must be maintained.

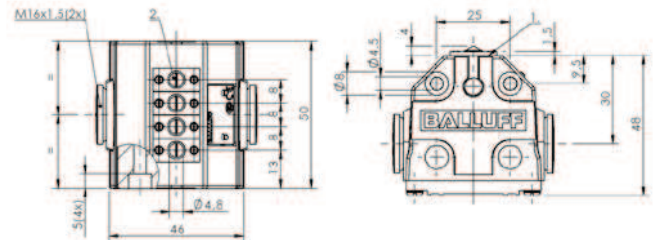
Series 40 multiple position switch

Standard:



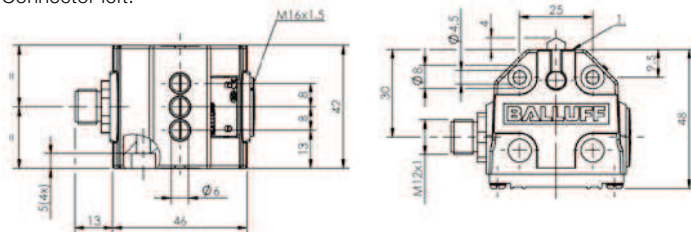
1) Reference edge

Chisel plunger with wiper plate:



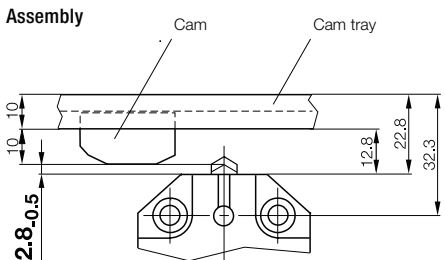
1) Reference edge
2) Anti-crystallization plunger

Connector left:



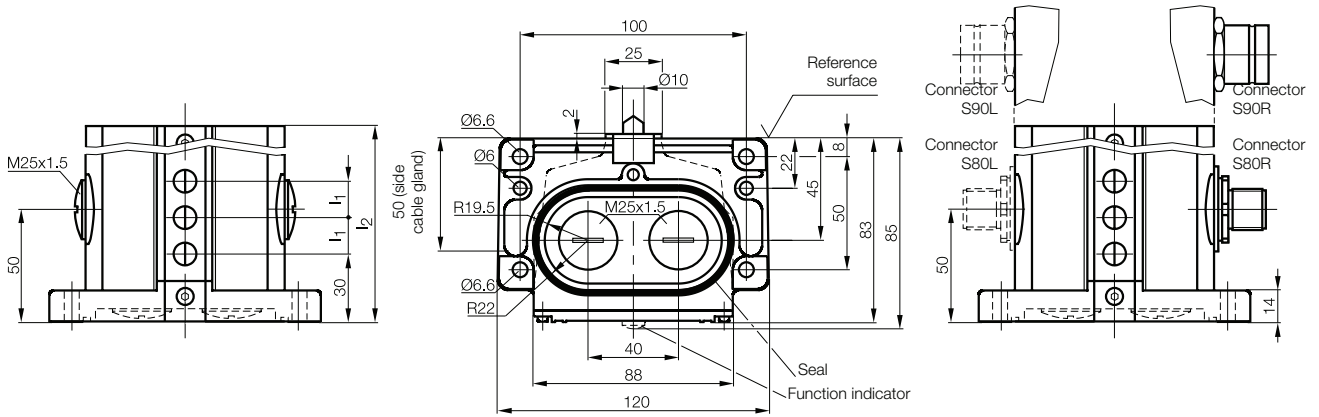
1) Reference edge

Assembly

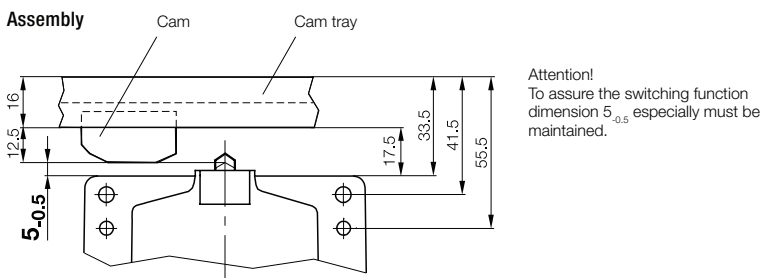


Attention!
To assure the switching function dimension 2.8-0.5 especially must be maintained.

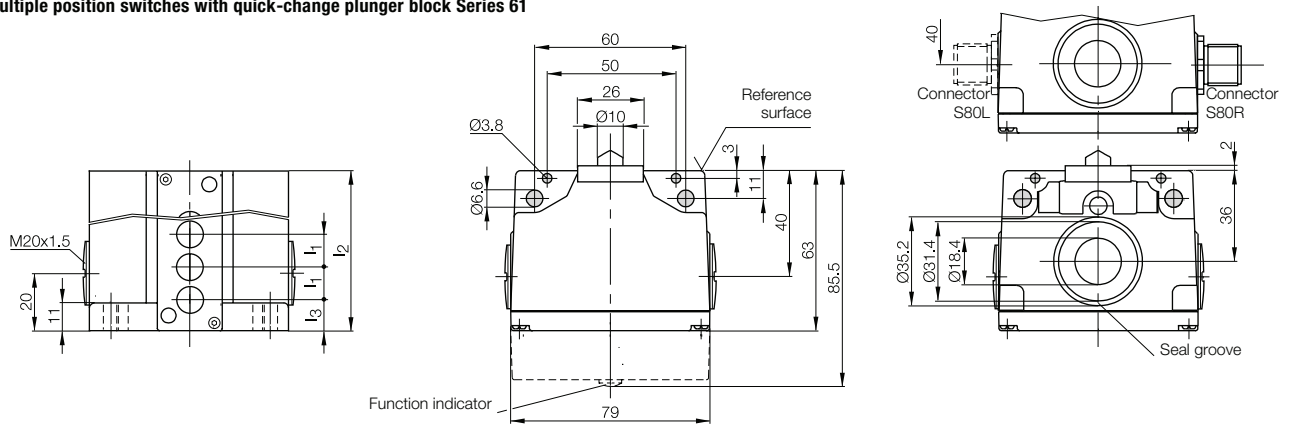
Multiple position switches with quick-change plunger block Series 100 compliant with DIN 43697



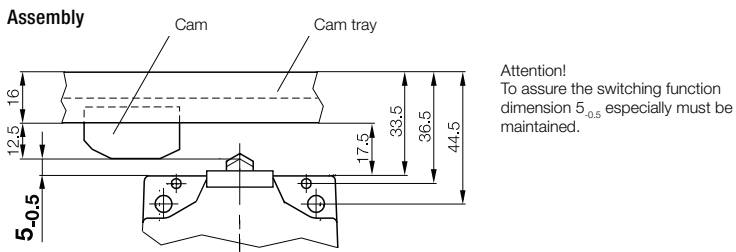
Assembly



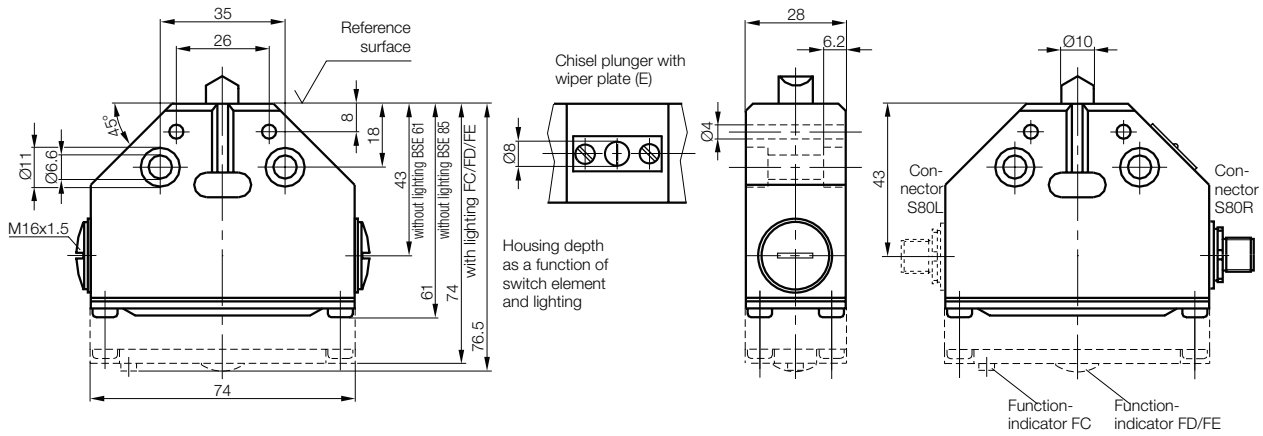
Multiple position switches with quick-change plunger block Series 61



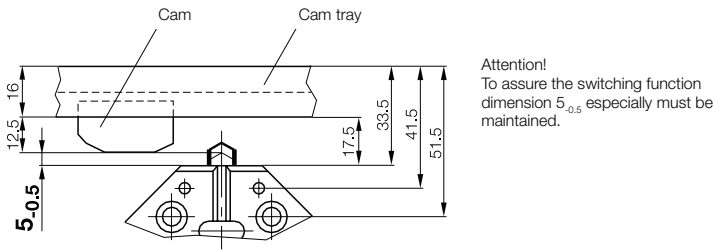
Assembly



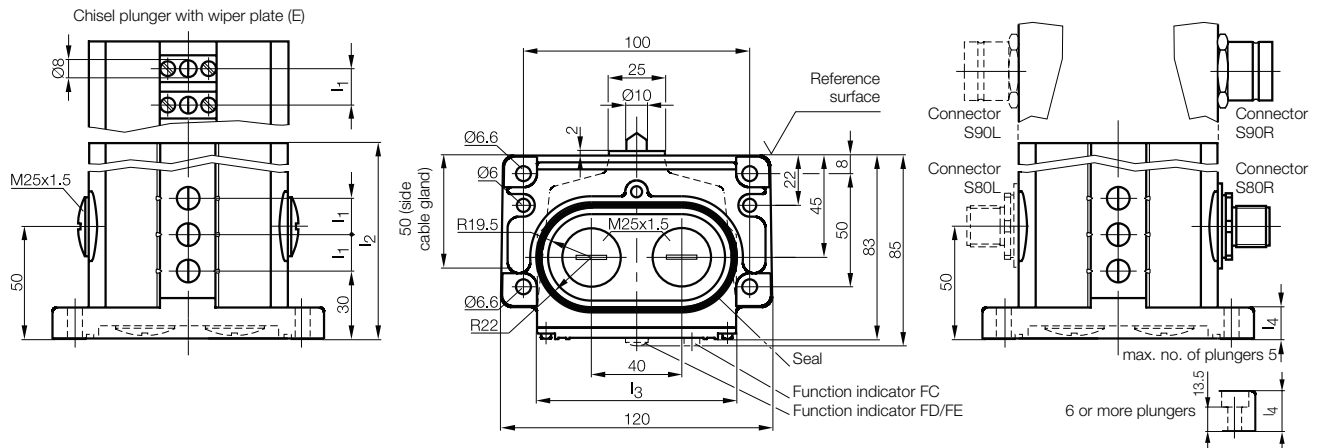
Position switch with safety switch positions Series F60 DIN 43693



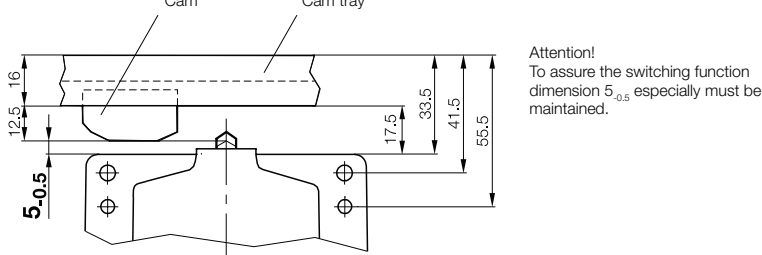
Assembly



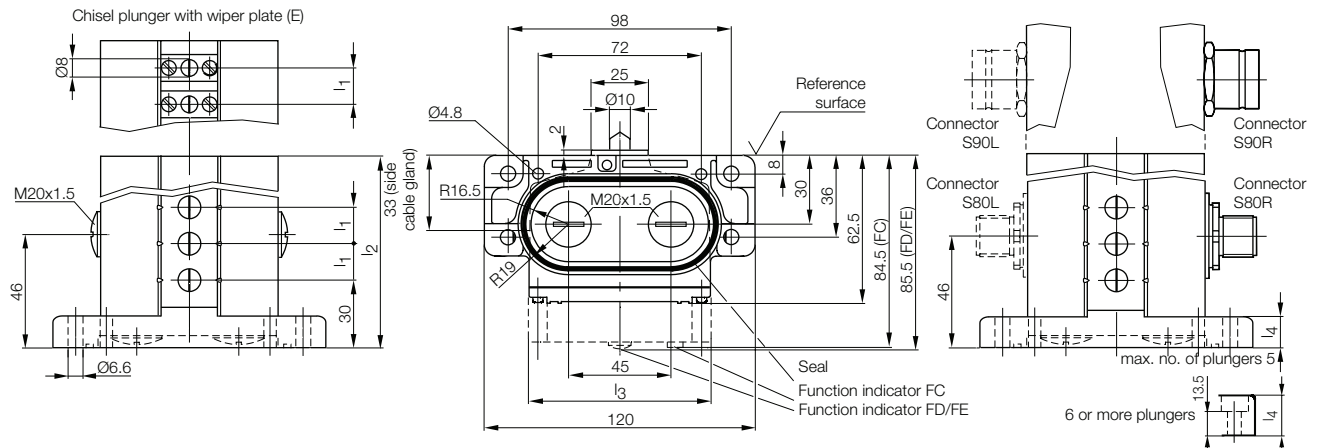
Multiple position limit switches with safety switch positions Series 100 DIN 43697



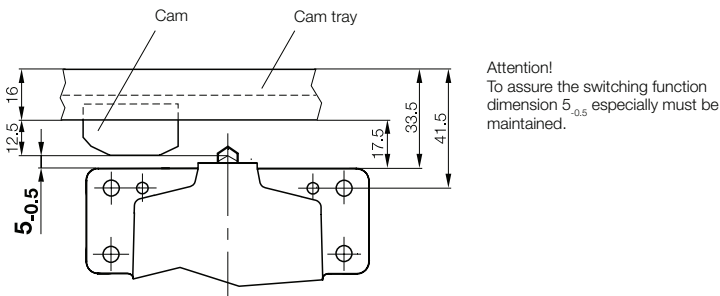
Assembly



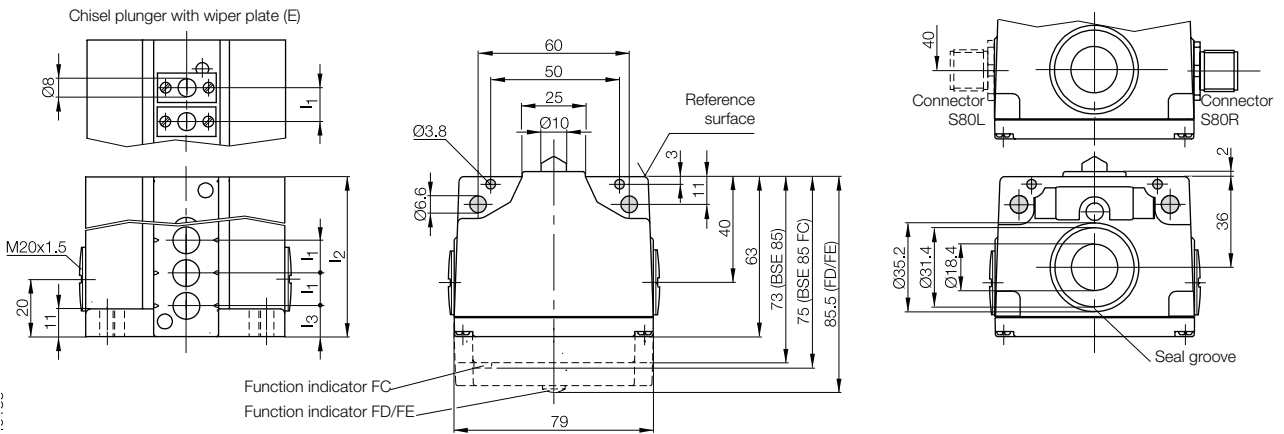
Multiple position limit switches with safety switch positions Series 62



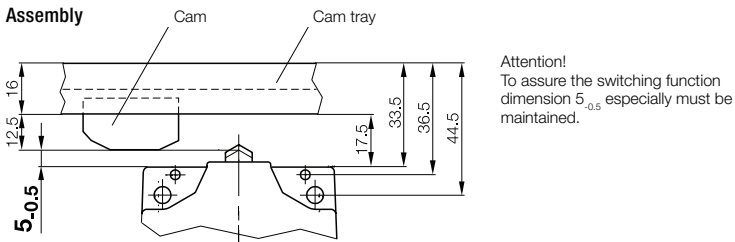
Assembly



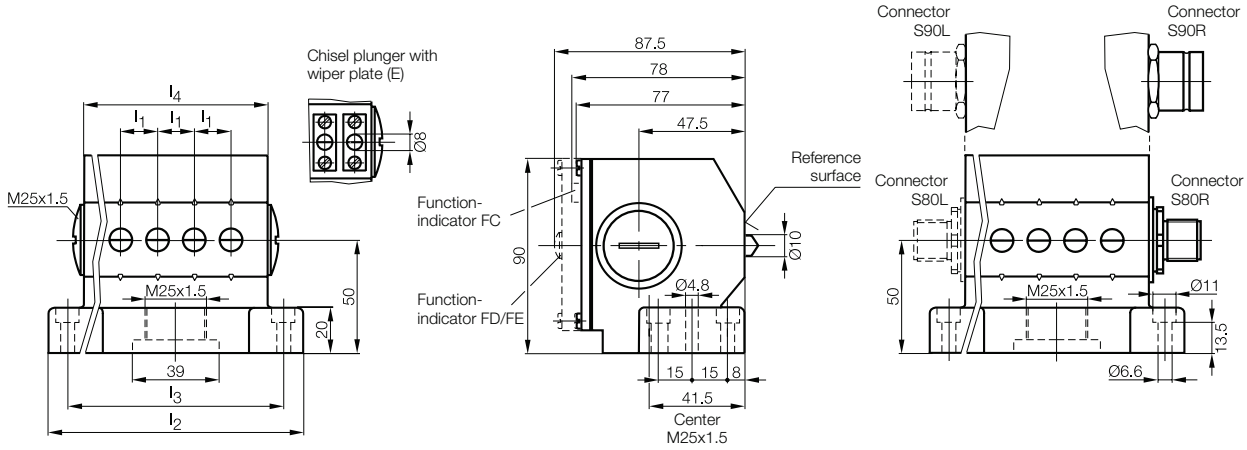
Multiple position limit switches with safety switch positions Series 61



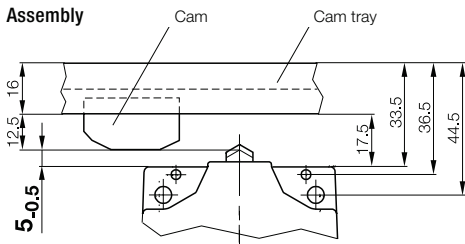
Assembly



Multiple position limit switches with safety switch positions Series 72

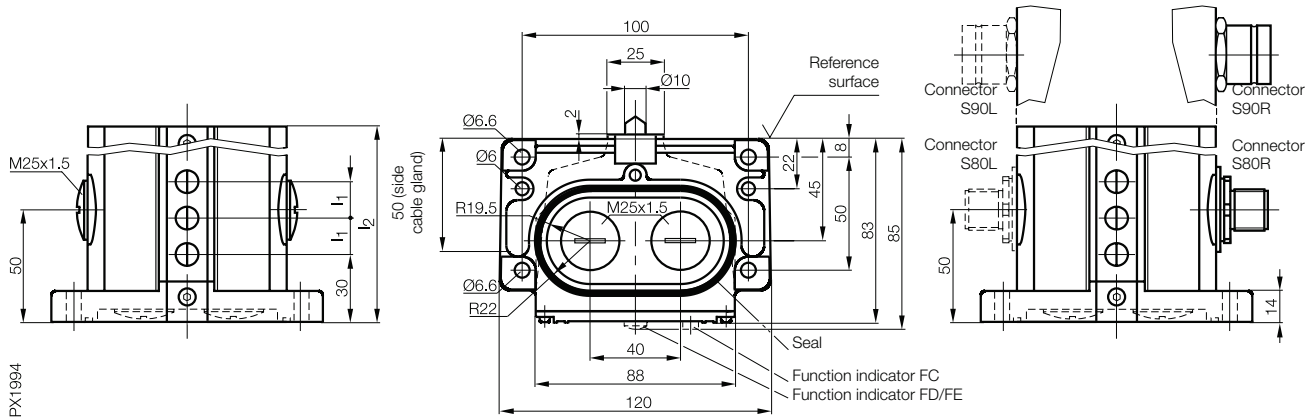


Assembly



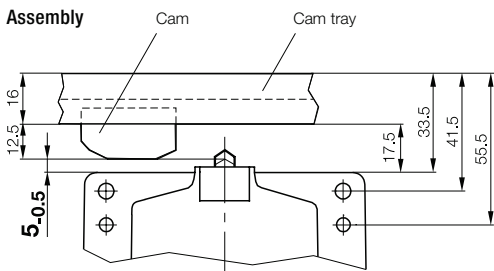
Attention!
To assure the switching function dimension 5_{0.5} especially must be maintained.

Multiple position limit switches with safety switch positions and quick-change plunger block Series 100



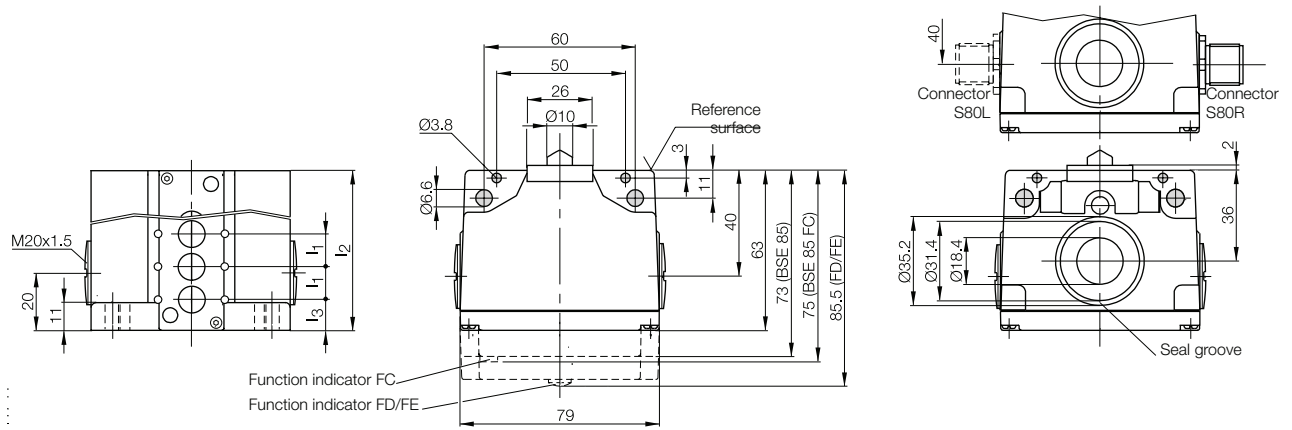
PX1994

Assembly

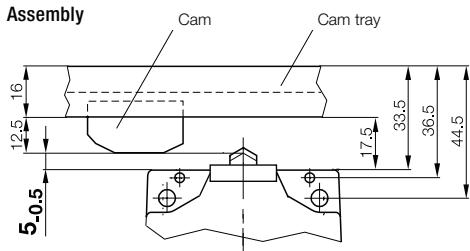


Attention!
To assure the switching function dimension 5_{0.5} especially must be maintained.

Multiple position limit switches with safety switch positions and quick-change plunger block Series 61

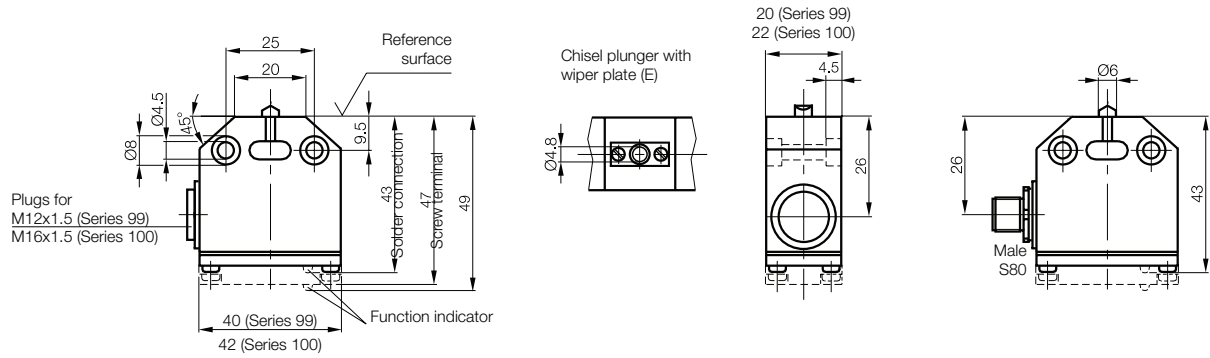


Assembly

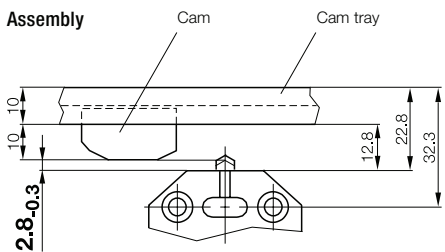


Attention!
To assure the switching function dimension $5_{-0.5}$ especially must be maintained.

Position switch with positive opening Series 99 and 100

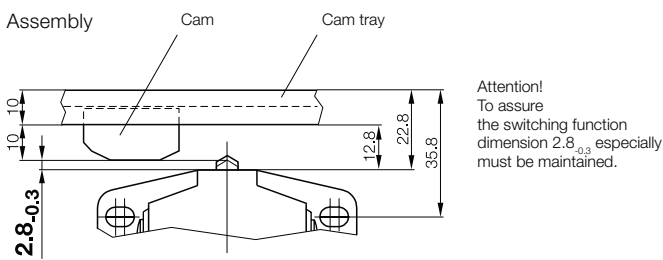
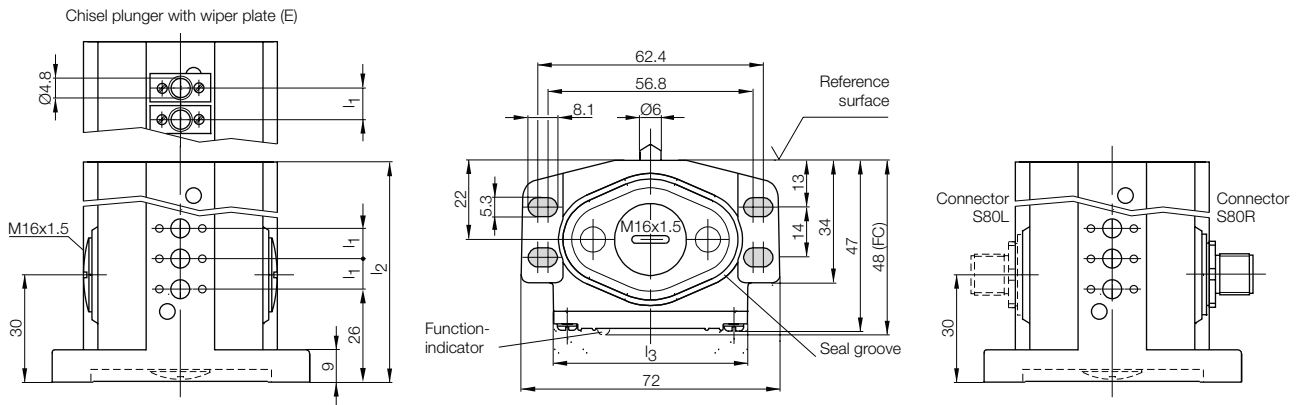


Assembly



Attention!
To assure the switching function dimension $2.8_{-0.3}$ especially must be maintained.

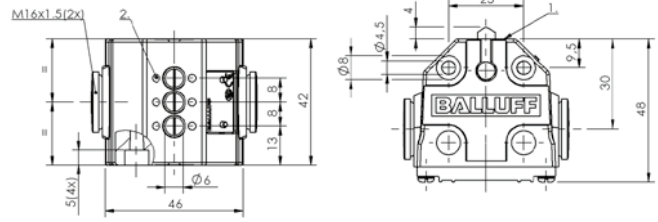
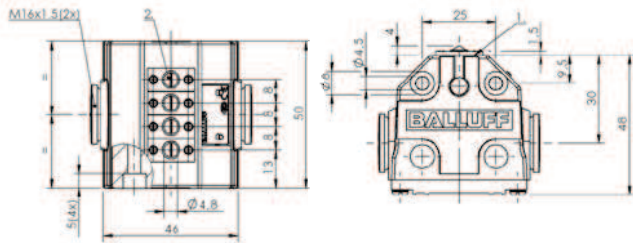
Multiple position limit switches with positive opening Series 46



Multiple position limit switches with positive opening Series 40

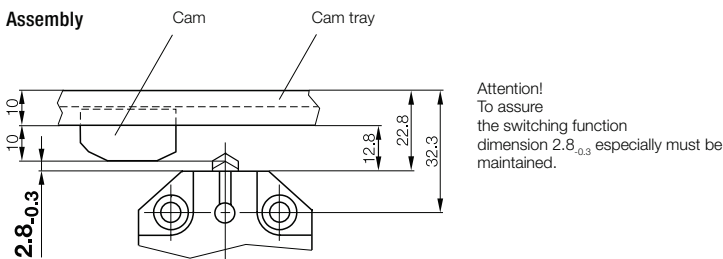
Chisel plunger with wiper plate:

Standard:

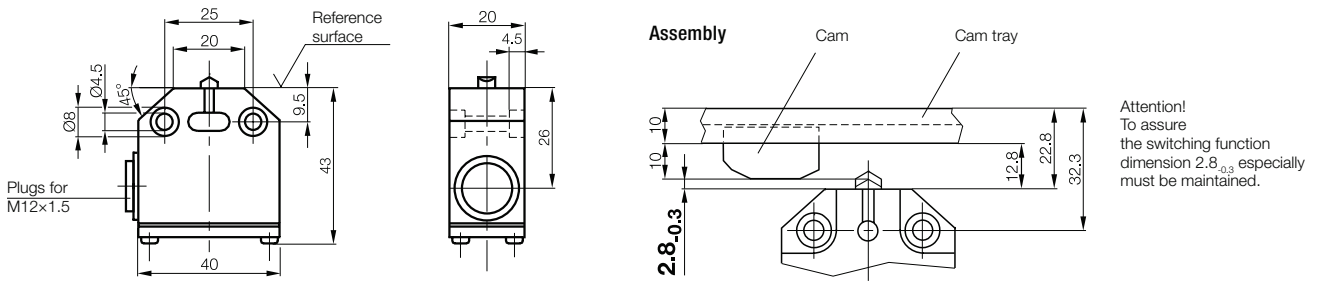


- 1) Reference edge
- 2) Anti-crystallization plunger

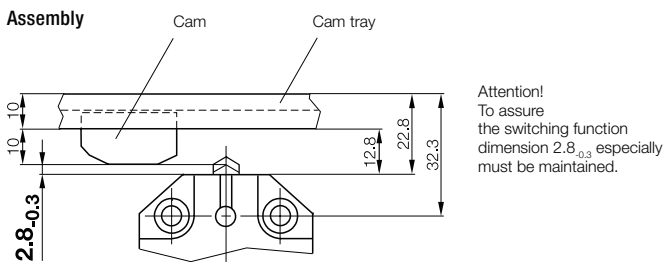
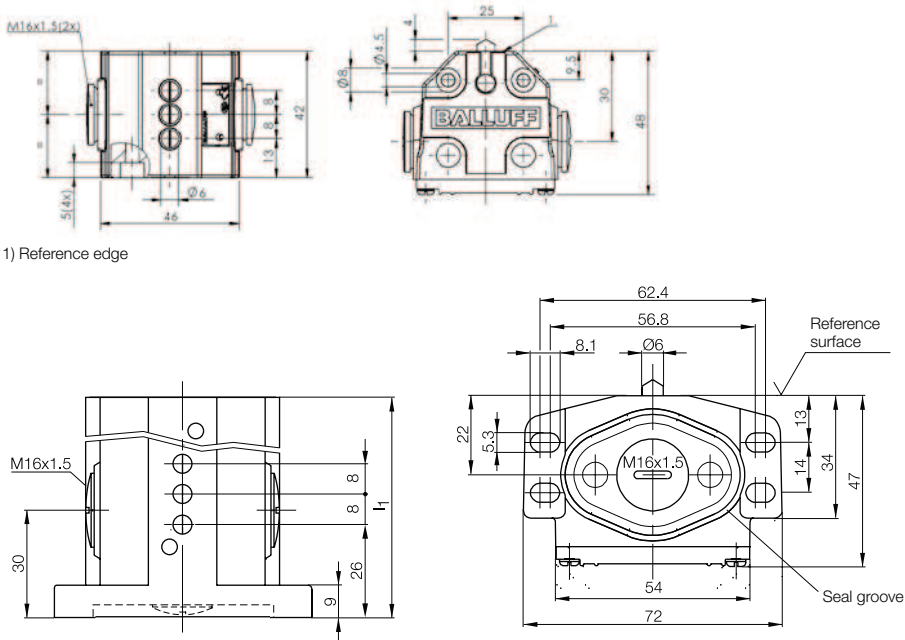
- 1) Reference edge
- 2) Mark. Safety switch position



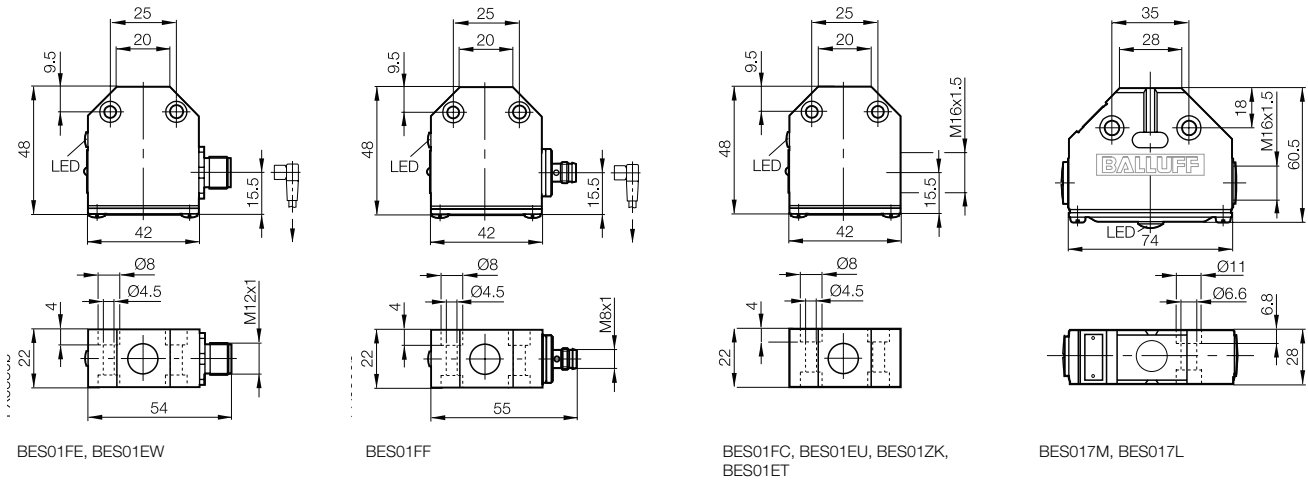
High-temperature position switch Series 99 and 100



High-temperature multiple position switches Series 46 and 40



Inductive Position Switches Series H2 and H3



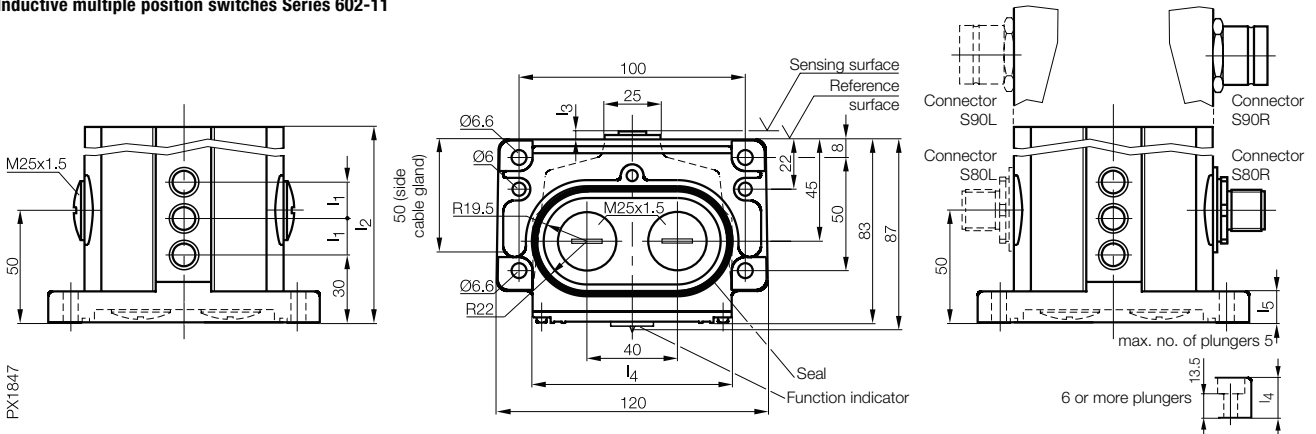
BES01FE, BES01EW

BES01FF

BES01FC, BES01EU, BES01ZK, BES01ET

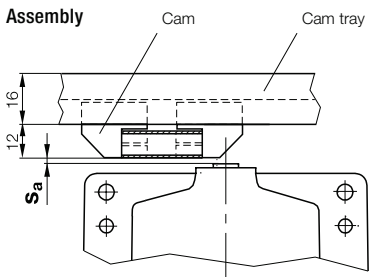
BES017M, BES017L

Inductive multiple position switches Series 602-11



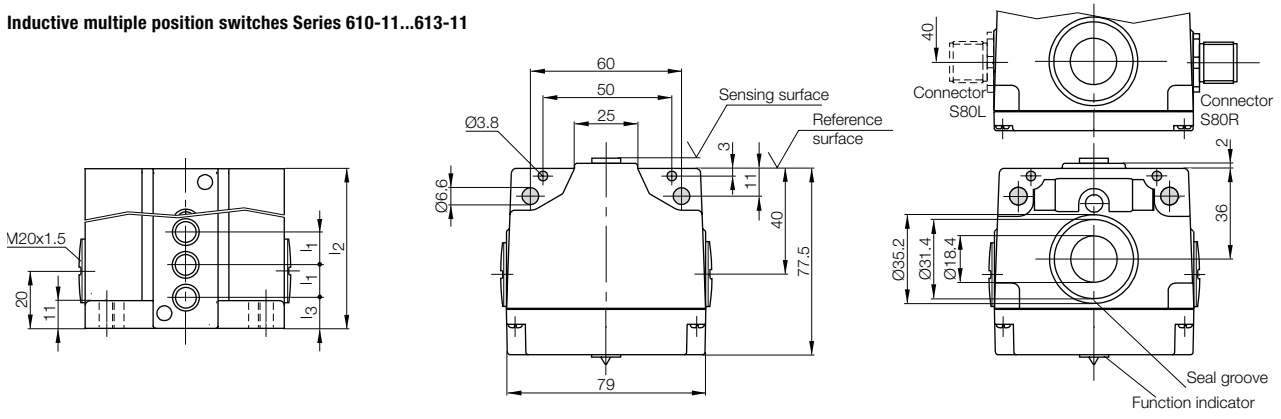
PX1847

Assembly

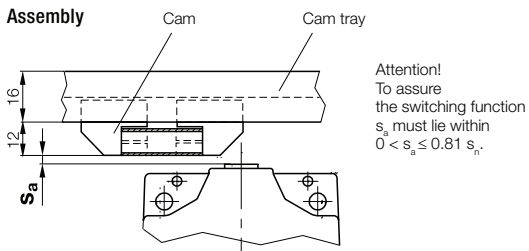


Attention!
To assure the switching function s_a must lie within $0 < s_a \leq 0.81 s_c$.

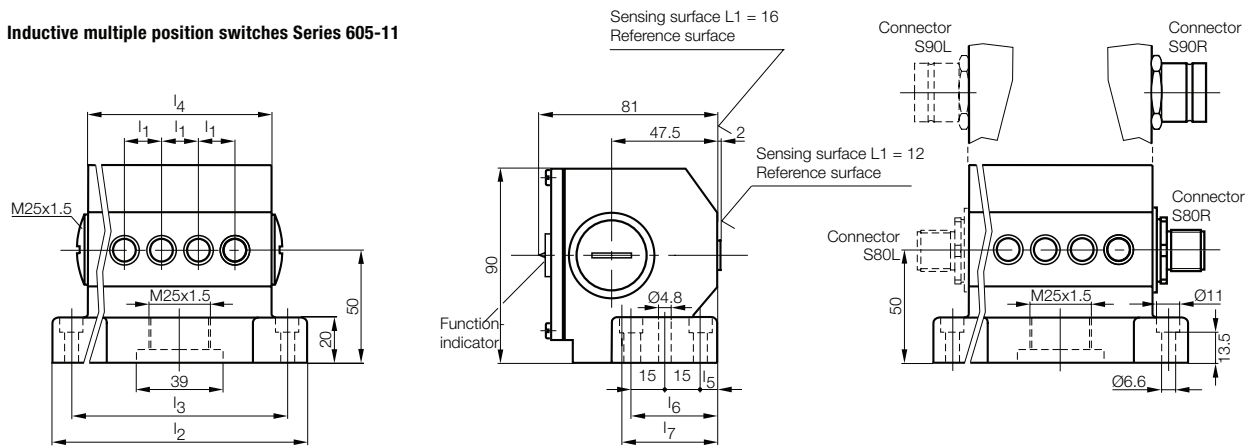
Inductive multiple position switches Series 610-11...613-11



Assembly



Inductive multiple position switches Series 605-11



Assembly

