

GEARED CAM LIMIT SWITCHES

BRLS-LV

- Combined worm/spur gears for high gear reductions requiring less mounting space; different, precisely graduated gear reduction
- Cam discs with precise adjustment
- Utilisation of switching contacts for switching voltages of 36 VDC, gold contacts on request
- Available with 4 contacts in 1 contact assembly block or 8 contacts in 2 contact assembly blocks
- Heavy duty ball bearing design
- Plastic housing IP 65
- 0,85 to 880 usable revolutions
- Potentiometer and up to 2 incremental or absolute encoder mounting possible



BRLS series geared cam limit switches are universal mechanical switching devices which present a large number of input shaft revolutions on the rotation angle of one single revolution of the cam discs.

The cam discs serve to operate the contacts.

BRLS series geared cam limit switches are used wherever specific ranges of travel can be limited indirectly only by switching devices.

Classical applications of these limit switches are lifting, travelling and slewing gears of cranes, yaw and pitch control in wind power stations, bucket elevators, etc. Especially where a danger to persons exists and the **use of positive opening switching contacts is required according to EN 60947, part 5 – 1, IEC 947 – 5 – 1**, the use of geared cam limit switches is the most efficient alternative.

Construction of the geared cam limit switch

The geared limit switch consists of a gearbox and switch combination which are located within a housing. The torque is positively transmitted from the input shaft to the switching shaft and, when using the precise adjustment "FV" of the cam discs, it is also transmitted up to the contact. The gear housing is made of glass – fiber reinforced synthetic material, the cap is not reinforced. Mounting as required.

Protection IP 65 to DIN VDE 0470 – 1 / EN 60529.

Working temperature -40 °C to +80 °C.

At 3 sides the housing is provided with pre – cut holes for cable entries which can be opened by the customer if necessary.

For fixing of the cable entries, insert fixing nuts. These nuts are protected against torsion. The thread lengths of the required glands are stated on the dimensional drawing.

The housing is provided with formed feet. If required, an additional flange can be screwed to the shaft input.



Special version with circuit board and encoder

Ordering Code/Key to Types

Switch type	Gear ratio (see table 1)	Number of contacts fitted (Standard: 4 max.: 8)	Type of contacts fitted (see table 2)	Pinionion	Options
BRLS				O = without pinion M... = Module Z... = Number of teeth f.e.: M16 / Z10	O = without potentiometer or encoder P = potentiometer mounting, specified separate E = encoder mounting, specified separate Different flanges on request

Precise adjustment and setting of switching points on request per separate specification with ordering code



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Gear - Table 1 for contact S and SS with cam disc 40° ø 50						
Nominal revolutions	Usable revolutions (rounded)	Gear ratio i (rounded)	1 rev. of the drive shaft - corresp. to an ang. motion of cam disc = °	Reset rev. at driving shaft + / - 1%		max. drive speed ¹⁾
				Clockwise rotation ²⁾	Counter-clockwise rotation ²⁾	
0.85	1	1	360	~0,03	~0,03	200
1.85	2	2	170	~0,04	~0,04	
3.9	4	4	80	~0,05	~0,05	
6.0	6	7	53	~0,06	~0,06	
9.0	9	10	35	~0,07	~0,07	
15	15	17	21	~0,10	~0,10	
25	26	30	12	~0,15	~0,15	
29	30	34	10.7	~0,40	~0,40	600
53	53	60	6.00	~0,50	~0,50	
76	76	85	4.21	~0,60	~0,60	
95	95	107	3.35	~0,65	~0,65	
135	136	153	2.35	~0,80	~0,80	
180	186	209	1.72	~1,0	~1,0	
260	264	298	1.21	~1,3	~1,3	
360	362	407	0.89	~1,70	~1,75	
435	436	490	0.74	~2,00	~2,1	
515	515	580	0.62	~2,3	~2,4	
620	621	698	0.52	~2,7	~2,80	
880	884	995	0.36	~3,7	~3,9	


1) For short - time operation higher driving speed possible on request
2) View of direction onto shaft

Table 2 / Contact Data

Contact designation	Contact type	Contact material	Switch actuation	Type of contact connection	Positive opening to EN 60947 - 5 - 1	Electrical data to EN 60947 - 5 - 1				Mech. life in mio. switching operations
						AC - 15 I[A]	U[V]	DC - 13 I[A]	U[V]	
S ¹⁾	Change - over contact	Silver	Snap action	Screw terminal	yes	1.5	230	0,5	60	10
SS ¹⁾				Flat plug 6,3						
SG ^{1) 2)}		Gold		Screw terminal						

1) Thermal permanent current I_{th} = 10A; Reference insulation voltage U_i = 36V at pollution degree 3
2) Contact SG for PLC applications (gold contacts)

Contact:
S
SS
SG
Change over switch



Contact connections
The standard contact 99 has glands for 2 x 1.5 mm² cables.
In the particular case the utilisation of switching contacts with flat plugs 6.3 x 0.8 mm is possible.
Caution!
With connection voltages exceeding 25 VAC insulated flat plugs only must be used.



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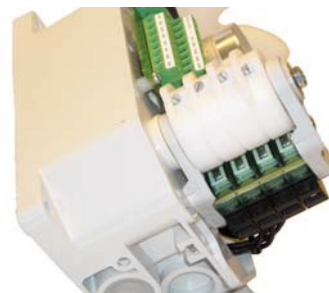
Cam discs

The cam discs are provided with 40 contact cams as standard. On request cam discs with any other cam angle can be provided at extra charge. Special cam discs are already made in our works as per the customer's specification.

For special cam discs with a firm program please provide a diagram similar to the below shown example drawing.

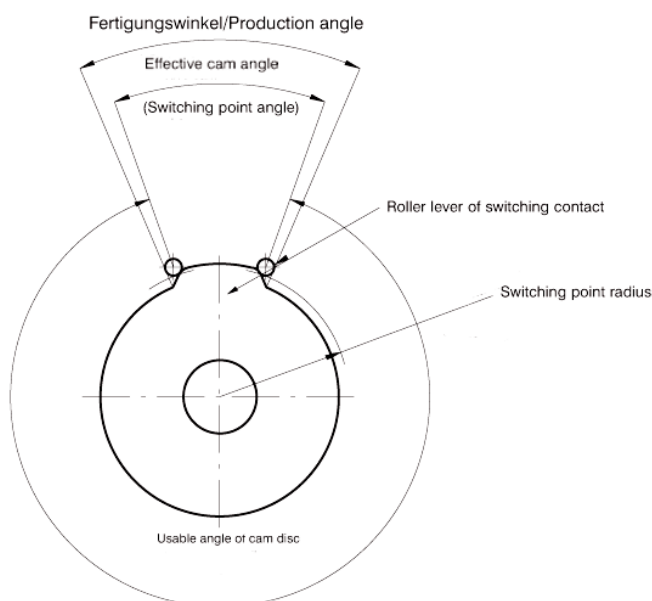


When not stating the cam angle on order placement, cam discs with a cam angle of 40 will be supplied.



Cam adjustment by screws for each cam

The cam discs are designated according to their effective cam angle. With BRLS series cam discs, this corresponds to the switching point angle on the switching point radius of the cam disc. The production angle results from the design of the cam disc.



Example drawing

Contact	0	15	60	270	315	360
1						
2						
3						
4						

The usable number of revolutions of the drive shaft of a geared switch enable by a cam disc can be calculated as follows:

$$\frac{(360^\circ - \alpha \text{ (effective cam angle)}) \times I \text{ (gear reduction of switch)}}{360^\circ}$$

Construction

As a standard the BRLS series geared switches are always supplied in pedestal execution. Housing and feet form one piece; the feet cannot be removed.

As an option a flange can be screwed to the input side of the geared switch.

Generally the fixing bores are provided for the two flange executions. They can be used optionally. The assembly dimensions are stated on the dimensional drawing (fixing pitch circle 96 or 100 mm is possible).

Protection

The housing has protection IP 65 to DIN VDE 0470 – 1 / EN 60529. To improve the protection against water penetration, the cap is equipped with a protruding dropping edge, which also covers the sealing.



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Standard Limit Switch Codes

Revolution ratio	Type of contact	2 switches	3 switches	4 switches
1:1	Snap	MY00010003LV	MY00010002LV	MY00010001LV
	Slow	MY00010004LV	MY00010005LV	MY00010006LV
1:5	Snap	MY00050002LV	MY00050003LV	MY00050001LV
	Slow	MY00050004LV	MY00050005LV	MY00050006LV
1:10	Snap	MY00100003LV	MY00100004LV	MY00100002LV
	Slow	MY00100005LV	MY00100006LV	MY00100007LV
1:15	Snap	MY00150004LV	MY00150003LV	MY00150002LV
	Slow	MY00150007LV	MY00150008LV	MY00150001LV
1:20	Snap	MY00200002LV	MY00200003LV	MY00200001LV
	Slow	MY00200004LV	MY00200005LV	MY00200006LV
1:25	Snap	MY00250006LV	MY00250003LV	MY00250001LV
	Slow	MY00250007LV	MY00250008LV	MY00250002LV
1:50	Snap	MY00500002LV	MY00500003LV	MY00500006LV
	Slow	MY00500028LV	MY00500017LV	MY00500007LV
1:75	Snap	MY00750007LV	MY00750008LV	MY00750004LV
	Slow	MY00750009LV	MY00750010LV	MY00800010LV
1:100	Snap	RL0 1000135LV	MY01000122LV	MY01000003LV
	Slow	MY01000001LV	MY01000071LV	MY00850008LV
1:150	Snap	MY01500002LV	MY01500011LV	MY01500008LV
	Slow	MY01500001LV	MY01500009LV	MY01500003LV
1:200	Snap	MY02000006LV	MY02000002LV	MY02000003LV
	Slow	MY02000007LV	MY02000004LV	MY02000008LV
1:250	Snap	MY02500003LV	MY02500007LV	MY02500008LV
	Slow	MY02500009LV	MY02500010LV	MY02500011LV
1:300	Snap	MY03000004LV	MY03000006LV	MY03000007LV
	Slow	MY03000008LV	MY03000009LV	MY05000003LV

Standard LV limit switches are equipped with 2,3 or 4 snap or slow action switches and with pointed cams MY140PI. Other assemblies and revolution ratios are available on request. It is possible to assemble up to 6 switches. Maximum revolution ratio 1:969.

BRLS-LV

Technical drawing of a 12V 40A battery terminal block. The drawing includes multiple views: a top view, a front view, a side view, and a perspective view. Key dimensions and features are labeled:

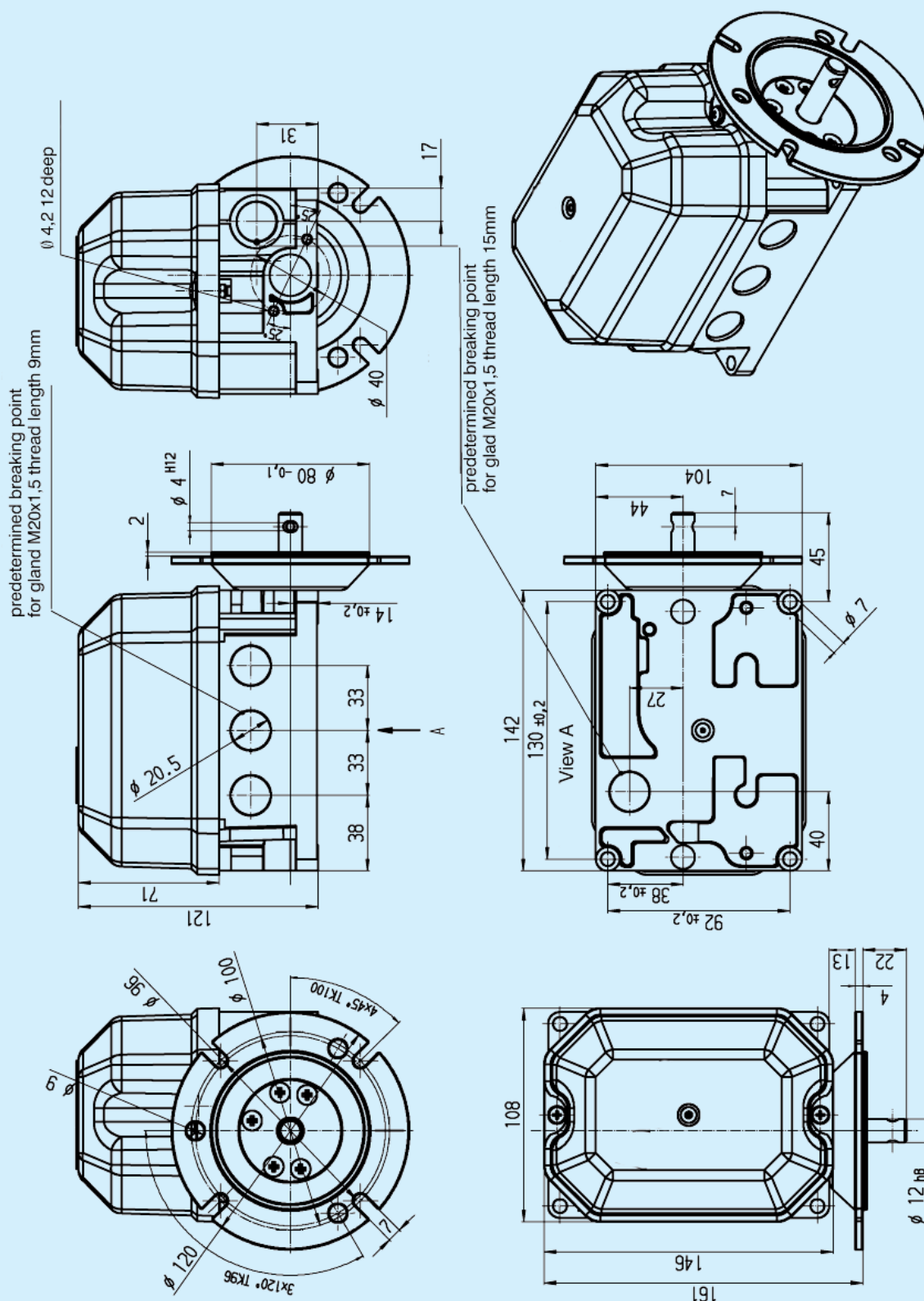
- Top View:** Overall dimensions are 146 mm (width) and 108 mm (height). The terminal width is 45 mm. The distance between terminals is 40 mm. The terminal height is 44 mm. The terminal width is 104 mm. The terminal height is 44 mm. The terminal width is 104 mm. The terminal height is 44 mm.
- Front View:** Overall dimensions are 121 mm (width) and 71 mm (height). The terminal width is 34 mm. The terminal height is 14 ± 0.2 mm. The terminal width is 34 mm. The terminal height is 14 ± 0.2 mm.
- Side View:** Overall dimensions are 142 mm (width) and 130 ± 0.2 mm (height). The terminal width is 38 ± 0.2 mm. The terminal height is 38 mm. The terminal width is 38 ± 0.2 mm. The terminal height is 38 mm.
- Perspective View:** Shows the terminal block with a 40A terminal and a 12V terminal. The terminal width is 40 mm. The terminal height is 40 mm. The terminal width is 40 mm. The terminal height is 40 mm.
- Labels:**
 - "predetermined breaking point for gland M20x1.5 thread length 9mm" (indicated by a dashed line).
 - "predetermined breaking point for gland M20x1.5 thread length 15mm" (indicated by a dashed line).
 - "View A" (indicated by a dashed line).
 - "12V" (indicated by a dashed line).
 - "40A" (indicated by a dashed line).



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Dimensional figure flange execution



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1. Potentiometer mounting

Potentiometers having the same angle of rotation as the cam discs, are mounted instead of a cam disc assy. Potentiometers with central fixing or with servo - flange can be used. In the case that Stromag shall supply the potentiometers or in case of subsequent assembly, we ask to adhere to the below shown dimensions.

Cam discs and potentiometers can also be driven by various gear reductions. In case of such requirements please consult us.

2. Mounting of incremental encoders

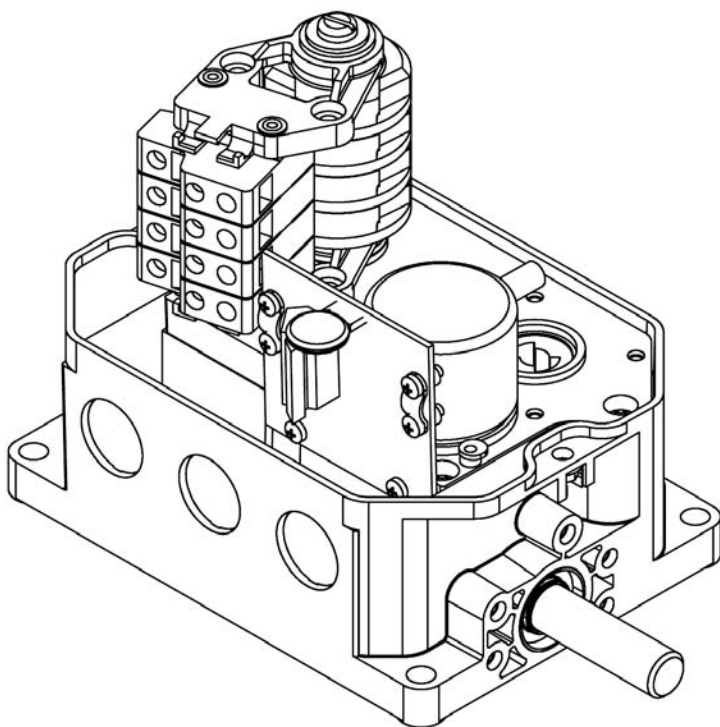
As standard, the switch is provided with the possibility to mount an incremental encoder.

Instead of a contact block, the incremental encoder can be mounted. The input speed for the encoder complies with the speed of the input shaft of the geared switch. The encoder is connected through a printed circuit board with terminals. It is absolutely necessary to connect the encoder by screened cables.



Encoder data:

Please refer to MEYLE encoder catalogue 26 and 40 mm housing diameter incremental or absolute shaft encoders



Special version with surge protection and encoder



Special version with one incrementale encoder and one absolute encoder



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