Characteristics

Switchgear with electro-mechanical switching components is suitable for speeds of up to 200/min.

These switchgear units are of robust construction and are maintenance free.

A rubber seal which is located in the lower section of the casing guarantees that the switchgear can be used in accordance with protection class IP 65 (also available on application in protection class IP 67; NEMA 4, 4X, 6, 6P, 11, 12).

The length of the pulse and the position for the switching point is programmed by means of the two independently rotating eccentric cam rings (180°).

No tightening or releasing of the cam rings is required.

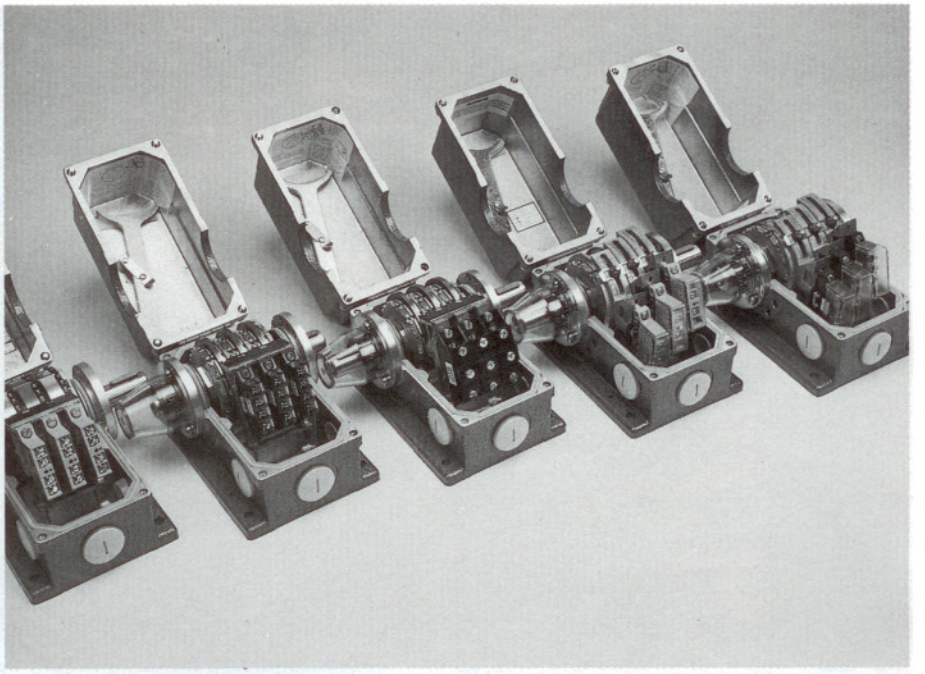
The precision switching component is operated by a roller shaft which transfers the electrical signals to the machine control.

For improved handling the roller shafts are located at an angle of 70° in comparison to the zero point on the switchgear shaft.

The following switching components (Snap action switches, positive break switches) are available:

BSE 44.0	with separate normally closed and normally open contacts, to DIN 43 695 – Snap action
BSE 67	changeover switch – Snap action
BSE 61	forced-opening, to VDE 0113 – Positive break

The BSE 61 switch element meets the requirements of a forced-opening independent trip switch.
The BSE 44 and BSE 67 switch elements do not meet the requirements of a forced-opening independent trip switch.



Set of cam rings.

The following torque levels are required in order to rotate the shaft of the switchgear unit whilst activating all push rods:

3-cam unit	0.5 Nm
6-cam unit	1.0 Nm
9-cam unit	1.5 Nm
12-cam unit	2.0 Nm
20-cam unit	3.5 Nm.

If several switchgear units are coupled then the torque values of the individual units added together accordingly.

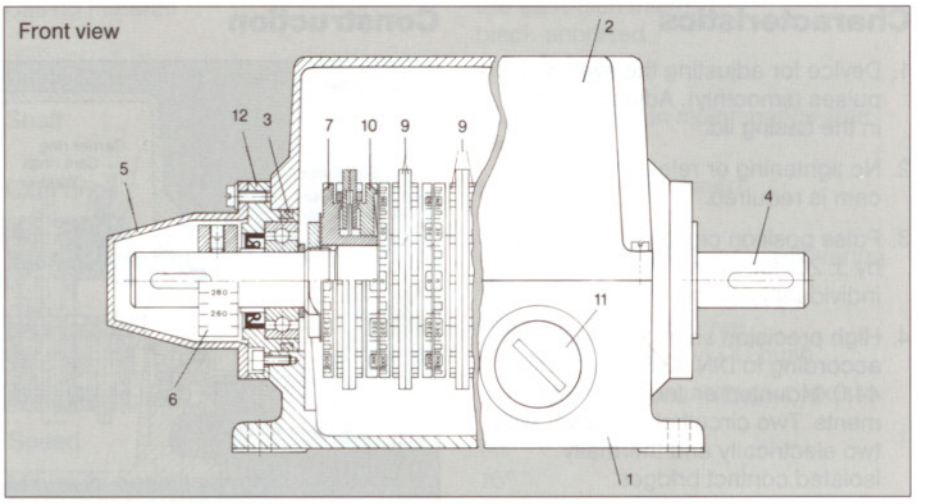
When the speed is changed by means of a gear the torque changes in the ratio of the increase or reduction respectively.

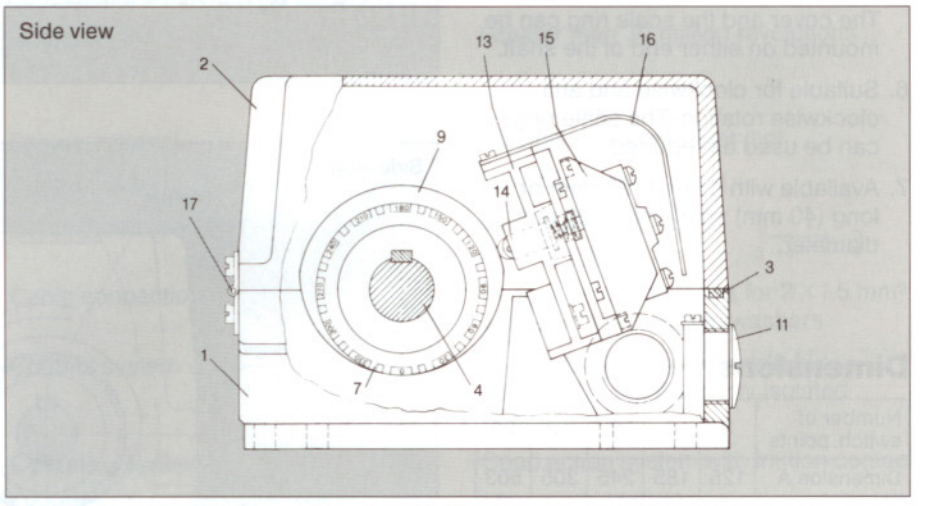
Drive Type

The switchgear can either be driven on the left or right hand side by means of a standard shaft end (40 or 20 mm long respectively, 20 mm diameter) with an adjusting spring.

Each shaft end is fitted with a central thread, M 10, depth 9 mm.

1 Bottom section of casing
2 Casing lid
3 Casing seal
4 Switching shaft with adjusting spring and centre thread
5 Cover for shaft end
6 Scale ring with markings
7 Carrier ring
9 Cam ring with adjustment ring (8)
10 Washer
11 Cable entry Pg 21
12 Bearing flange
13 Switchgear bridge with push-rod guide and mounting for snap action switch.
14 Maintenance-free push-rod mechanism
15 Snap action switch
16 Cover for snap action switch
17 Hinge





Construction

The shaft (4), the set of cam rings (7, 9, 10) an the push-rod (14) which operates the snap action switch (15) are located in a robust casing (1+2). The casing is divided into the bottom section (1) an the lid (2) which are connected by hinges (17).

Cable entries Pg 21 (11) are provided on three sides of the lower section for the electrical installation. A transparent cover (5) protects the free shaft end on the side opposite the drive from being touched and gives a view of the scale ring (6) with the markings.

BALLUFF precision switchgears can be supplied with 3, 6, 9, 12 or 20 switching points.
Mounting holes for fitting couplings and gears are provided on both flanges (12) of the switchgear (see accessories on pages 29 to 31).

Function

For operating the individual snap action switches (15) one set of cam rings (7, 9, 10) for each switching point is mounted on the shaft (4) which is located in maintenance-free bearings.

One set of cam rings consists of:
- A support ring with scale
- Two independently rotating cam rings with adjustments rings (9+8)
- One thrust washer with scale.

This construction makes it possible to smoothly adjust the operation of each individual switching point between 0° and 360° without releasing or tightening a cam or screw. (The adjustment tools are located in the casing lid).

The switching point is indicated by a mark on each cam ring (see page 4).

The carrier ring (7) mounted on the shaft and the thrust washer (10) are provided with a degree scale which serves for smooth adjustment of the pulse length and the pulse position respectively. The relevant position of the switching shaft can be read off the scale ring (6).