

DRAW BAR POWER UNIT PTN 7

APPLICATION

Servomotors are designed to rebuild control mechanisms by means of a direct, reversible move and constant speed. Servomotors control mainly the closing and pressure reducing valves.

MACHINE FUNCTIONING

The engaged force is transferred onto the draw bar nut when the column of Belleville washers placed between two ball bearings in which the nut is embedded is pressed down. Power switches are controlled by moving the nut in its axial direction. When the value of switch-off power is reached in both directions of the output draw bar move, along its entire working stroke, the power switches will be turned off.

The servomotor's stroke for the „OPEN“ position and the „CLOSED“ position is determined by the working valve stroke. The „OPEN“ draw bar position must be limited by a full-stop outside the servomotor, or a position microswitch in the servomotor may be used to turn off the driving electromotor.

The switching position of both position-signaling switches can be set independently throughout the entire range of the working stroke.

DESCRIPTION

The servomotor is a linear, draw bar system equipped with constant control speed of the output part resetting.

An asynchronous motor and self-locking gear mechanism are seated in a box with a removable cover. Conductors are brought in by means of gland bushings. The servomotor output draw bar is terminated with a clutch which connects the servomotor and a valve. The servomotor construction enables the tightening of connecting elements according to the execution of a relevant valve (flange, columns, etc.). The servomotor is equipped with power switches, terminal position switch, signaling switches, position indicator, thermal fuse of the driving electromotor and heat resistance.

Furthermore, the servomotor can be equipped with a position transmitter and adjustable stroke according to the valve stroke.

The transmitter can be accompanied with a converter featured with a power signal of 4 - 20 mA for dual-conductor connection in a measuring loop (direct feeding from a measured signal).

Other electrical outputs possible: i.e. 0 - 20 mA, 4 - 20 mA and 0 - 10 V must be provided with independent feeding 24 V AC, that is galvanically separated from the output.

TECHNICAL DATA

Operational conditions

Surrounding temperature -20°C to +60°C

At temperatures lower than -15°C, and in humid environment it is necessary to turn on heating resistance. This applies even when the servomotor is resting.

Relative humidity of surrounding environment 5 to 100 % with condensation whose maximum limit of water contents is 28 g H₂O/kg of dry air
Atmospheric pressure 66 to 108 kPa

Vibrations, according to IEC 654-3

group

frequency

shift amplitude

acceleration amplitude

V1

10 to 150 Hz

0,075 mm

9,8 m.s⁻²

Working position

down is considered basic.

arbitrary. The position when the output part faces
However, the placement under the
controlled equipment is not recommended.

Feeding	
supply voltage	230 V + 6%, - 12% or 24 V + 10%, - 15% AC
frequency	48 to 52 Hz
Cover, according to EN 60 529	IP 65

Construction rendering of the sensing unit is suitable for operation in difficult climates. This climatic resistance was not verified by a relevant state testing laboratory.

Construction data

Rated force	16 kN, 20 kN
Output part resetting speed	20 - 80 mm.min ⁻¹
Rated force accuracy	± 10% of the rated force
Accuracy of output part resetting speed	± 10%
Servomotor working stroke	
maximum	70 mm
minimum	10 mm

Maximum and minimum working strokes of the servomotor are restricted by the valve's working stroke which can be arbitrary within the range of the working stroke. Power switches are turned off when the pre set value is reached in any position of the working stroke.

Output part backlash at max. 25% load of the rated force	max. 0,3 mm
Reversing time interval	min. 50 ms (without load)
Load factor	
interrupted run S4-25%	100 cycles/hour, 630 cycles/hour on a short-term basis (max. 24 hours); 10 min
short-term run S2	
Current carrying capacity of the power switches and signaling contacts	250 V/ 6 A AC
Transmitter's parameters	
total resistance	100 Ω ± 10 Ω
residual resistance in the „CLOSED“ position	max. 5 Ω
residual resistance in the „OPEN“ position	max. 5 Ω
nonlinearity	max. ± 2 %
hysteresis	max. 2 %
current carrying capacity	max. 1 W
Electrical insulation resistance	min. 20 MΩ

Electrical strength of insulation:

a) servomotor with a supply voltage of 230 V AC	
- a circuit for feeding and signaling contacts opposite a protection clamp	1 350 V AC
- a circuit for feeding and signaling contacts opposite a transmitter circuit	2 300 V AC
- a transmitter circuit opposite a protection clamp	350 V AC
b) servomotor with a supply voltage of 24 V AC	
- a circuit for signaling contacts opposite a transmitter circuit and opposite the transmitter's circuit	2 300 V AC
- a circuit for signaling contacts opposite a protection clamp	1 350 V AC
- a circuit for feeding and a transmitter circuit opposite a protection clamp	350 V AC

Power required	
motor	max. 120 VA
heating resistance	max. 15 VA
Weight	about 10 kg

ORDERS

Orders must indicate:

- name
- product number
- number of ordered pieces

Example:

PTN7 lever servomotor -8 pieces

DELIVERIES, STORAGE AND TRANSPORTATION

The servomotors are supplied with an assembled clutch used for the connection on the valve draw bar. The SZ signaling switch is set about 1 mm before the „CLOSED“ position, and the SO signaling switch is set about 1 mm before the „OPEN“ position depending on the servomotor's stroke.

The servomotors are supplied along with an assembly manual. Wire diagram is placed on the servomotor cover.

Servomotors are supplied in packaging which guarantees their stability in contact with mechanical and/or temperature effects, in accordance with IEC 654-1 and 654-3. Servomotors can be transported by train or cars. When transportation by airplane is arranged servomotors must be placed in a heated, sealed area.

Servomotors can be stored in the same packaging at temperatures ranging from 0 to 40°C, and at a maximum relative humidity up to 80%.

ASSEMBLY INSTRUCTIONS

Assembly and connection

The servomotor should be attached to controlled equipment with the aid of columns. The connection is portrayed in Picture 1.

The servomotor should be connected to supply voltage after it is fastened to the valve and set. Wire diagram and a terminal box drawing are shown in Picture 2.

Manual control can be implemented when the cover is removed. Pressing a toothed wheel down will release the toothed wheel from its engagement. When a draw bar is reset the toothed wheel must be pressed down. When the machine is started the toothed wheel returns into its engagement by automatically. The servomotor cover should be removed after you release two nuts. When the cover is removed the terminal box can be accessed and the supply voltage of signaling switches and position switch can be connected to it.

Servomotor's attachment to the valve

Screw the column extension into the valve's flange and tighten the screw properly. Slide the servomotor's column into the extension and screw a cap nut.

Servomotor's setting

Using manual control set up the servomotor's draw bar about 1 mm in front of the full/stop columns, in the „CLOSED“ position. Press the valve's draw bar to the „CLOSED“ position too. Screw the valve spindle in the clutch and secure with the aid of the nut. Using manual control repeatedly travel over the valve seat and check-up whether whether the moment switch switches off in the valve seat area and not in the full-stop columns.

Terminal position switch setting

Set the KPO switch to the required stroke as follows: release the M3 screws; move the KPO switch in a groove so that it would become engaged at the required stroke.

Signaling switches setting

The servomotor will be set gradually to those positions which are to be signaled. Release the M3 screws; move the switch into the groove, which will ensure that all relevant switches will become engaged.

Transmitter setting

Servomotors with a transmitter are set for the required stroke. If a different stroke is selected, the following adjustment procedures must be carried out:

1. Using the manual control reset the servomotor draw bar to the „CLOSED“ position.
2. Exchange the toothed wheels which determine the stroke (provided by the manufacturing plant).
3. Confirm that the residual resistance value is in the „CLOSED“ position. This value must correspond with the value indicated in the 'Construction data' chapter. If the value does not comply with these set out values it must then be adjusted by means of turning over the transmitter.
4. Reset the servomotor to the „OPEN“ position and re-check the residual resistance value.

Servomotor connection

A switch and a fuse must be installed within the mains supply. The clamps are designed for connection of conductors in a space of 1.5 mm². The servomotor will be connected by means of Cu conductors whose total insulation resistance will be at least 10 MΩ. When the conductors are connected, their bushings will be secured with an appropriate sealing material.

Commissioning

When the servomotor is attached to the controlled equipment, and when its setting and voltage connection are completed, the servomotor will be ready to be operated.

MARKING

The servomotor plate reads this information:

- trade mark
- 'made in Czech Republic' line
- product number
- production number
- rating voltage, frequency and power required
- resetting speed
- rating force
- rating voltage and rated current of switches
- covers

QUALITY GUARANTEE

The manufacturer provides the servomotor with a 12-month guarantee in compliance with the Commercial Code. Faults that will occur during the guarantee period due to defective material or faulty execution will be repaired free of charge provided that the device is presented to the manufacturer in the original or equal packaging. The guarantee however does not include faults caused by unauthorized changes/repair of the device, by non-compliance with technical and operational conditions set out by the manufacturer, or by violent damage.

ATTENDANCE AND MAINTENANCE

It is recommended to treat the toothed wheels and the motion screw with suitable lubricant after 1/2 a year normal operation (e.g. COSTRAC H2 and LUBRAK-HT, respectively).

REPAIR

All repair work is carried out by the manufacturer.

