# Technical data sheet

FOR THE ROTARY ACTUATOR

Type: HSH 1 SG
Art. no.: 4816900

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| Model | Vane-type rotary actuator<br>In principle the actuation has a pressure- and viscosity-dependent internal leak volume flow rate. For example, if an external torque affect the rotary actuator shaft in an idle mode, the rotary actuator shaft shifts slowly from its angle position! |
| Series | HSH: Rotary actuator without an end position damping, without a internal rotating angle limitation and with a radial and axial hydrostatic supported shaft.<br>The rotary actuator can be equipped with components are adapted to the specific application, such as:<br>- Valve connection plates with differnt hole patterns<br>- Control valves and rotary encoders of all well-known manufacturers<br>- Pulsation accumulators, hubs and shrink discs or clamping sets |
| Size | 1 |
| Mounting style | |
| - Rotary actuator housing | single-sided face mounting with thread according to DIN 13-1 - M 6<br>single-sided flange mounting with through holes d = 6,5<br>Strength class of the fastening screws ≥ 10.9 |
| - Drive shaft end | cylindrical shaft end for shrink disc or clamping set with d = 25 g6 |
| - Centre hole in the drive shaft end | DIN 332-2 - D M 8 |
| Connection type | flange surface with through holes and whitworth pipe thread according to DIN ISO 228-1;<br>A, B and P with d=6 in the flange surface of the rear motor cover and L G3/8 radial in the rear motor cover |
| Installation position | arbitrary; Depending on the position of installation and case of application a load may cause running ahead the rotary actuator drive shaft. In such a case, appropriate countermeasures must be taken! |
| Installation instructions | see operating instructions |
| Rotary angle limitation | An external rotary angle limitation is recommended! |
| Intended use | The rotary actuator is intended for generation an alternating torque in a stationary application. |

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| max. nominal pressure | $p_{N\,max}$ | bar | 280 | | [1] |
| min. minimum pressure | $p_{M\,min}$ | bar | 50 | Required for a proper functioning of the load-free drive. | |
| max. starting pressure without load | $p_{St\,max}$ | bar | 4.2 | at an output pressure of p = 1 bar | |
| specific torque | $M_{sp}$ | Nm/bar | 1.02 | torque constant | [2] |
| theoretical torque | $M_{th}$ | Nm | 286 | at $\Delta p = p_{N\,max}$ | [2] |
| mechanical efficiency ≈ | $\eta_{mec}$ | - | 0.985 | at $\Delta p = p_{N\,max}$ and $\omega = \omega_{max}$ | [3] |
| effective torque | $M_{eff}$ | Nm | 281 | at $\Delta p = p_{N\,max}$ and $\omega = \omega_{max}$ | [3] |
| number of working chambers | z | - | 4 | | |
| nominal angle of rotary | $\varphi_N$ | grad | 125 | The internal stop must not be approached! | [2] |
| max. operating angle of rotary | $\varphi_{A\,max}$ | grad | 120 | This corresponds to a maximum amplitude of ± 60°. | |
| maximum radial force | $F_{r\,max}$ | N | 2 000 | force acting centered on the journal of the drive shaft | [4] |
| maximum axial force | $F_{ax\,max}$ | N | 3 000 | force acting centrically on the journal of the drive shaft | [4] |
| weight ≈ | m | kg | 14.5 | ± 10%, incl. oil filling | |
| mass moment of inertia of drive shaft | $J_{W0}$ | $kgcm^2$ | 3.50 | ± 5%, without other attachments such as hub, coupling, rotation encoder, etc. | |
| max. angular speed | $\omega_{max}$ | rad/s | 19.0 | This corresponds to 1089 deg/s or an equivalent rotational speed of n= 181 $min^{-1}$. | [1] |
| specific displacement | $v_{sp}$ | $cm^3/°$ | 0.18 | This results in a theoretical operating volume of $V_A$= 21.4 $cm^3$. | [2] |
| theoretical volume flow rate required | $Q_{th}$ | l/min | 11.6 | at $\omega = \omega_{max}$ | [2] |
| max. total leakage volume flow rate | $Q_{L\,max}$ | l/min | 9.00 | at $\Delta p = p_{N\,max}$ and $\nu$=50 $mm^2/s$ (internal leakage + leakage at port L) | [3] |
| effective required volume flow rate | $Q_{eff}$ | l/min | 20.6 | at $\Delta p = p_{N\,max}$, $\omega = \omega_{max}$ and $\nu$=50 $mm^2/s$ | [3] |
| leakage fluid pressure | $p_{L\,max}$ | bar | 0.2 | | |
| permissible pressure fluid | | | | HLP mineral oils according to DIN 51524 T2 | |
| temperature range of pressure fluid | $\vartheta_{Öl}$ | °C | -20 – +80 | The viscosity range set in operation is to be observed. | [1] |
| range of kinematic viscosity | $\nu$ | $mm^2/s$ | 20 – 150 | short-term, the optimum operating viscosity range is 40 – 50 $mm^2/s$ | |
| cleanliness class of pressure fluid | | | | Max. permissible degree of pollution according to ISO 4406 class 17/15/12. | |
| range of ambient temperature | $\vartheta$ | °C | 0 – +60 | | |
| design of component surfaces | | | | metallic bright and wetted with anticorrosion agents | |

Subject to technical modifications and error!

[1]) The simultaneous occurrence of two or more maximum values of temperature, pressure and angular speed requires the written consent of the manufacturer!
[2]) Theoretically determined value without manufacturing tolerances and if so an efficiency.
[3]) Median recorded in test series; an inferential variance is possible.
[4]) The data of maximum forces are valid only when the hydrostatic bearing is in operation with p N max!





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