Technical data sheet

FOR THE ROTARY ACTUATOR

Type: HSL 09 SZ
Art. no.: 3207105

Model	Vane-type rotary actuator 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	HSL: Rotary actuator as basic model without an end position damping and without an internal rotating angle limitation. The rotary actuator can be equipped with components are adapted to the specific application, such as: - Valve connection plates with differnt hole patterns - Control valves and rotary encoders of all well-known manufacturers - Hubs and pulsation accumulators
Size	09
Mounting style	
- Rotary actuator housing	single-sided face mounting with thread according to DIN 13-1 - M 20 Strength class of the fastening screws ≥ 8.8
- Drive shaft end	involute spline shaft according to DIN 5480-W 130x5,0x24x 8f
- Centre hole in the drive shaft end	DIN 332-2 - D M 24
Connection type	pipe thread according to DIN ISO 228-1; A and B: G3/4; axial in the rear cylinder 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.

max. nominal pressure	$p_{N\,max}$	bar	160		[1]
min. minimum pressure	$p_{M\,min}$	bar	15	Required for a proper functioning of the load-free drive.	
max. starting pressure without load	$p_{St\,max}$	bar	8.0	at an output pressure of p = 1 bar	
specific torque	M_{sp}	Nm/bar	164.59	torque constant	[2]
theoretical torque	M_{th}	Nm	26 334	at $\Delta p = p_{N\,max}$	[2]
mechanical efficiency ≈	η_{mec}	-	0.950	at $\Delta p = p_{N\,max}$ and $\omega = \omega_{max}$	[3]
effective torque	M_{eff}	Nm	25 018	at $\Delta p = p_{N\,max}$ and $\omega = \omega_{max}$	[3]
number of working chambers	z	-	2		
nominal angle of rotary	φ_N	grad	292	The internal stop must not be approached!	[2]
max. operating angle of rotary	$\varphi_{A\,max}$	grad	290		
recom. min. operating angle of rotary	$\varphi_{A\,min}$	grad	22	If smaler rotating angles are to be realised in continious operation, the manufacturer must be consulted.	
maximum radial force	$F_{r\,max}$	N	25 000	force acting centered on the journal of the drive shaft	
maximum axial force	$F_{ax\,max}$	N	12 500	force acting centrically on the journal of the drive shaft	
weight ≈	m	kg	350.0	± 10%, incl. oil filling	
mass moment of inertia of drive shaft	$J_{W\,0}$	$kgdm^2$	55.13	± 5%, without other attachments such as hub, coupling, rotation encoder, etc.	
max. angular speed	ω_{max}	rad/s	1.4	This corresponds to 80 deg/s or an equivalent rotational speed of n= 13 min^{-1}.	[1]
specific displacement	v_{sp}	cm^3/°	28.73	This results in a theoretical operating volume of V_A= 8 330.6 cm^3.	[2]
theoretical volume flow rate required	Q_{th}	l/min	138.3	at $\omega = \omega_{max}$	[2]
max. internal leakage volume flow rate	$Q_{L\,max}$	l/min	0.69	at $\Delta p = p_{N\,max}$ and ν=50 mm^2/s	[3][4]
effective required volume flow rate	Q_{eff}	l/min	139.0	at $\Delta p = p_{N\,max}$, $\omega = \omega_{max}$ and ν=50 mm^2/s	[3][4]
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	ν	mm^2/s	18 – 150	short-term, the optimum operating viscosity range is 30 – 50 mm^2/s	
cleanliness class of pressure fluid				Max. permissible degree of pollution according to ISO 4406 class 18/16/13. To increase service life, we recommend according to ISO 4406 class 17/15/12.	
range of ambient temperature	ϑ	°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]) In mint condition of the internal seals and their counter-surfaces!

Hense Systemtechnik GmbH & Co. KG
Flottmannstr. 55
D-44807 Bochum

Fon +49 (0)234 95388-0
service@hense-systeme.de
www.hense-systeme.de