The most compact precision gearbox with the largest hollow shaft:

The new miniaturized Galaxie® gearbox

WITTENSTEIN

The miniaturized Galaxie® gearbox takes the proven principle of our classic Galaxie® a step further. The result: innovative kinematics enabling almost full surface contact during power transmission – in an extremely compact footprint. Thanks to this unique concept, the miniaturized Galaxie® performs significantly better than established gearbox types with the same diameter in almost all dimensions. It combines the highest levels of torsional rigidity, torque density and overload capacity with a very large hollow shaft and maintains zero backlash throughout its entire lifetime.

Galaxie® in miniature compared to usual strain wave gearboxes
· 40 % higher maximum torque T_{max}
· 30 % higher torque density
· 3-times higher rigidity over complete torque range
· Up to 50 % larger hollow-shaft
· Zero backlash over service life

Gear box		SAG 090	SAG 110
Gearbox diameter	mm	90	110
Length	mm	55.5	59.6
Hollow shaft diameter	mm	31	41
Weight	kg	1.5	2.5
Technical data			
Overall ratio		60	61
Nominal output torque	Nm	70	120
Max. acceleration torque	Nm	150	250
Emergency stop torque	Nm	375	625
Max. input speed	1/min	4200	3600
Torsional rigidity & bearing			
C_{t21} [1]	[Nm/arcmin | 10^4 Nm/rad]	35 | 12.0	70 | 24.0
K_3 [1]	[Nm/arcmin | 10^4 Nm/rad]	24 | 8.3	42 | 14.4
K_2 [1]	[Nm/arcmin | 10^4 Nm/rad]	23 | 7.9	40 | 13.8
K_1 [1]	[Nm/arcmin | 10^4 Nm/rad]	17 | 5.8	30 | 10.3
Max. tilting moment	Nm	150	250

[1] Torsional rigidity:
C_{t21}: Average gradient of the hysteresis in the range of 50 to 100% of T_{max}
K_1: Average gradient of the hysteresis in the range below 10 Nm for SAG090 and below 15 Nm for SAG110
K_2: Average gradient of the hysteresis in the range between 10 and 25 Nm for SAG090 and between 15 and 50 Nm for SAG110
K_3: Average gradient of the hysteresis in the range over 25 Nm for SAG090 and over 50 Nm for SAG110

More precision
The miniaturized Galaxie® extremely high torsional rigidity and higher dampening mean medical robots can perform surgical procedures much more precisely. Thanks to the higher machining precision, the quality of industrial products can likewise be increased. Absolute zero backlash likewise enables more precision in the application, e. g. when moving robot axes.

Space and weight savings
The miniaturized Galaxie® extremely high torsional rigidity and high torque density mean you can downsize the drive train or upgrade the application without any increase in footprint. The large hollow shaft can be used very efficiently, e. g. for wiring or for integrating media and/or components. The high torque density simultaneously permits the weight of the drive train to be reduced.

Maximum safety
The miniaturized Galaxie® extremely high torsional rigidity provides crucial safety reserves in case of overload. For example, there are no consequences if the surgeon accidentally touches the surgical robot's arm. Media can be supplied through the large hollow shaft without any problem – and downtime due to broken or pinched cables is reduced to a minimum. The high torque density can serve as a safety buffer.

More Information about the miniaturized Galaxie® gearbox