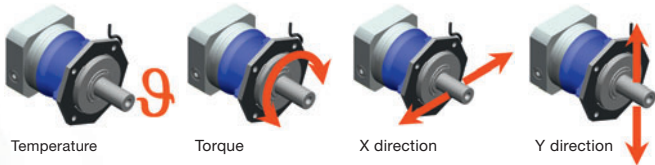


Understanding processes through intelligent sensor technology

Sensor components manufactured by WITTENSTEIN AG enable the use of measuring technology in high precision SP+ series planetary gearboxes. Similar to the sensor gearboxes from the TP+ series, these gearboxes are suitable for installation in standard gearboxes from the same series. See page 3 for more information.



Integrated sensors – measured parameters



Intelligence in the gearbox

Monitoring, measuring and optimising the process and control quality are the most important requirements in sensor applications. Different sensors can be combined with the overall system, depending on these requirements and the depth of knowledge about the application. The gearbox is subjected to all kinds of mechanical load: torques, shear forces, speed, thermal loads, wear and play.

SP+ IQ 075, 100 and 140 with integrated sensors

Technical data

The alpha SP+ gearbox

Maximum power density

The SP+ now eclipses the outstanding performance of the SP gearbox as the maximum acceleration torque was increased during the development phase.

Extra convenience

The SP+ can be attached in any position with maximum reliability and precision. This alpha-patented motor attachment is also available with integrated thermal length compensation as an option. The helical teeth on the gearbox run so smoothly during operation, you will hardly hear it.

A positioning accuracy of less than one angular minute guarantees maximum precision and extends your production potential.

The materials, geometry, seals and output bearings combine perfectly to produce a gearbox with a guaranteed extra-long service life.

SP+ IQ – Integrated sensors

Integrated sensors for measuring values at the gearbox output for gearbox sizes SP+ 075, 100 and 140.



Please refer to the “SP+ The new generation” brochure or the main catalogue for specific SP+ gearbox data (not sensor-dependent).

Measuring accuracy $\pm 2\%$
(percentage of the measurement range)
Resolution 0.5%
(percentage of the measurement range)
Temperature accuracy $\pm 2K$
If the radial force is 1/5 of the max. tilting torque, the torque signal deviates by $<1\%$.

Please contact alpha for information on other gearbox types and sizes as well as measurement ranges.

SP+ IQ 075

			Max. permitted load	Measurement range MB
Max. acceleration torque ^{a)} (max. 1000 cycles per hour)	T_{2B}	Nm	T_{2B}	T_{2B} (mind. 90)
EMERGENCY STOP torque ^{b)} (permitted 1000 times during the service life of the gearbox)	T_{2Not}	Nm	150	x ^{d)}
Max. radial force ^{b), c)}	F_{2RMax}	N	2500	2500
Max. axial force ^{b), c)}	F_{2AMax}	N	–	x ^{d)}
Max. permitted housing temperature		°C	+90	+90
Tilting rigidity ^{b)}	C_{2K}	Nm/arcmin	–	
Torsional rigidity ^{b)}	C_{t12}	Nm/arcmin	–	

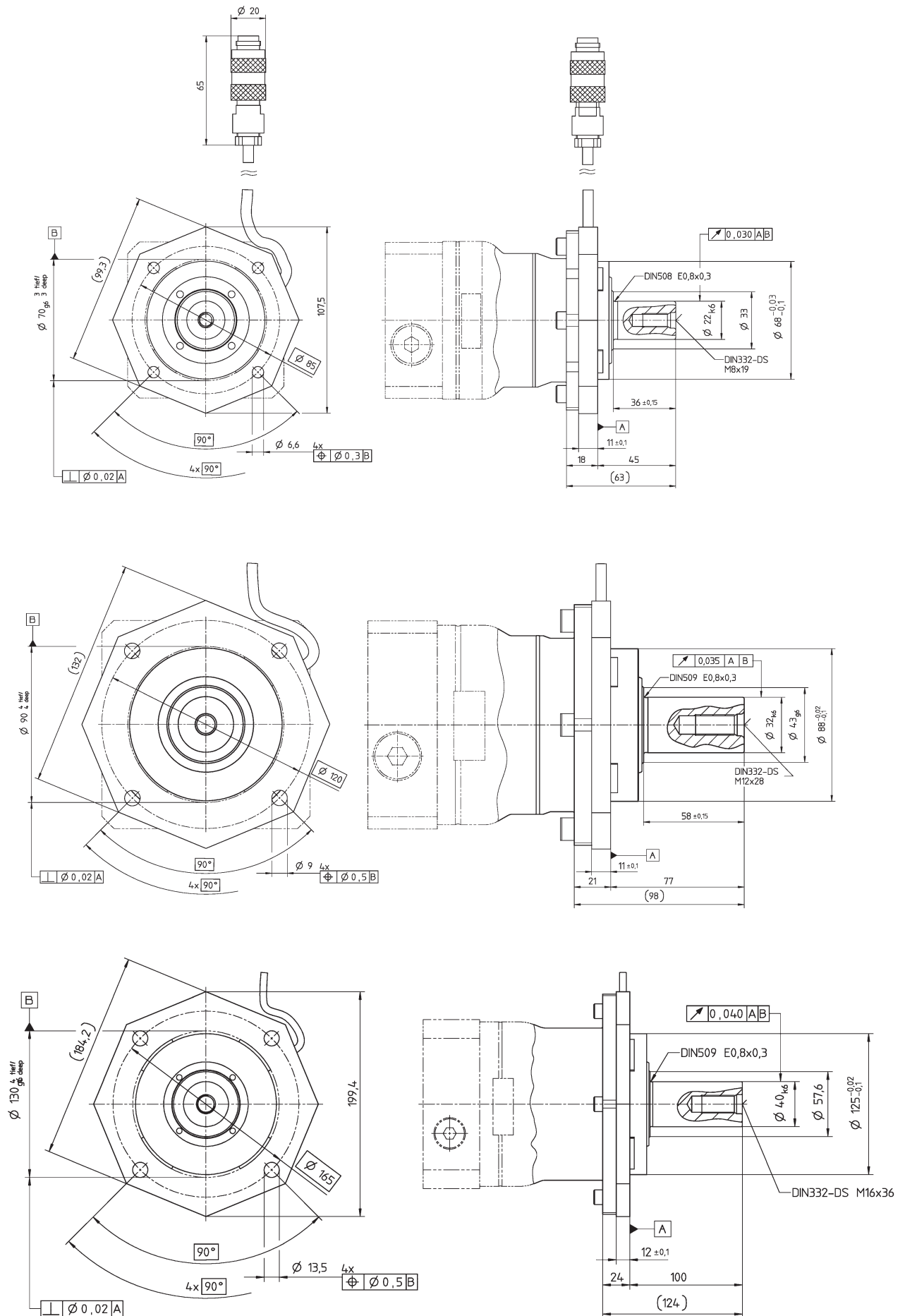
SP+ IQ 100

			Max. permitted load	Measurement range MB
Max. acceleration torque ^{a)} (max. 1000 cycles per hour)	T_{2B}	Nm	T_{2B}	T_{2B} (mind. 230)
EMERGENCY STOP torque ^{b)} (permitted 1000 times during the service life of the gearbox)	T_{2Not}	Nm	400	x ^{d)}
Max. radial force ^{b), c)}	F_{2RMax}	N	3000	3000
Max. axial force ^{b), c)}	F_{2AMax}	N	–	x ^{d)}
Max. permitted housing		°C	+90	+90
Tilting rigidity ^{b)}	C_{2K}	Nm/arcmin	–	
Torsional rigidity ^{b)}	C_{t12}	Nm/arcmin	–	

SP+ IQ 140

			Max. permitted load	Measurement range
Max. acceleration torque ^{a)} (max. 1000 cycles per hour)	T_{2B}	Nm	T_{2B}	T_{2B} (mind. 600)
EMERGENCY STOP torque ^{b)} (permitted 1000 times during the service life of the gearbox)	T_{2Not}	Nm	1250	x ^{d)}
Max. radial force ^{b), c)}	F_{2RMax}	N	9450	9450
Max. axial force ^{b), c)}	F_{2AMax}	N	–	x ^{d)}
Max. permitted housing temperature		°C	+90	+90
Tilting rigidity ^{b)}	C_{2K}	Nm/arcmin	–	
Torsional rigidity ^{b)}	C_{t12}	Nm/arcmin	–	

^{a)} depending on the gearbox ratio
^{b)} the value may be less than with standard gearboxes
^{c)} relates to the shaft centre
^{d)} no measurement range available

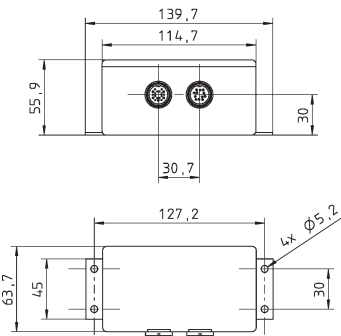


The SP+ IQ has a smaller centring depth than SP+ gearboxes.
However, the useful length of the output shaft on gearboxes from the SP+ series has been reduced by 11 to 14 mm due to the design characteristics.

Non-tolerated dimensions ± 1 mm

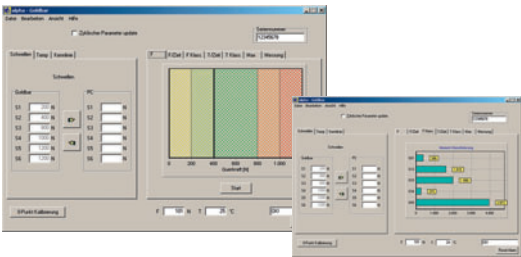
Electronics box

Evaluation electronics for registering, storing and processing measured data from sensor gearboxes. A cable about 0.5 m in length can be connected between the electronics box and the sensor gearbox to increase the flexibility of the system. The electronics box serves as an interface to other evaluation equipment such as a notebook or an overriding machine control.



Interfaces

- The following interfaces are available:
- serial (RS232)
 - analogue interface
 - Current interface (e.g.: 0 – 20 mA)
 - Voltage interface (e.g.: 0 – 10 V)
 - Various field buses via protocol converter (e.g.: CanBus, Profibus, etc.)



Sensor software

Evaluation software for direct display of: maximum values, load histograms, operating hours, characteristic curve parameters, serial numbers. Extended measuring functions with graphic display of measured values, oscilloscope function, triggered measured value acquisition.

Export function for exporting measured data: Data is saved in ASCII format and can be exported to any other

programme (e.g. Excel) or even cymex® calculation software for drives manufactured by alpha getriebebau GmbH. **Configuration** of evaluation electronics, **direct output** of actual parameters by calibrating the measuring system, gearbox report (in html format) for **recording current torques**.

Order codes

Sensor gearbox = low backlash planetary gearbox + integrated sensors

Sensor gearbox – order code SP+ IQ

SP 140**R**-MF2-25 -0G1-2S alpha IQ SP+

R = Short gearbox

Prepared for sensor technology

Sensor kit-00-S-SP 140-**LMMO**

Sensor kit for short gearbox

electr. interface
00 = RS232
01 = analogue voltage + RS232
02 = analogue current + RS232

perm. red. $T_{2\text{emer}}$ in Nm
C = 150
G = 400
O = 1250

F_{rad} y

Meas. range F_{rad} x- / y-
Direction in N
B = 2500
D = 3000
M = 9500

Torque
Measurement range in Nm:
D = 90
G = 230
L = 600

Any questions?

Have you any specific questions regarding our products and services? Visit our homepage www.wittenstein.de for more information.

WITTENSTEINsensors_gb_2007_1 Subject to modifications

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