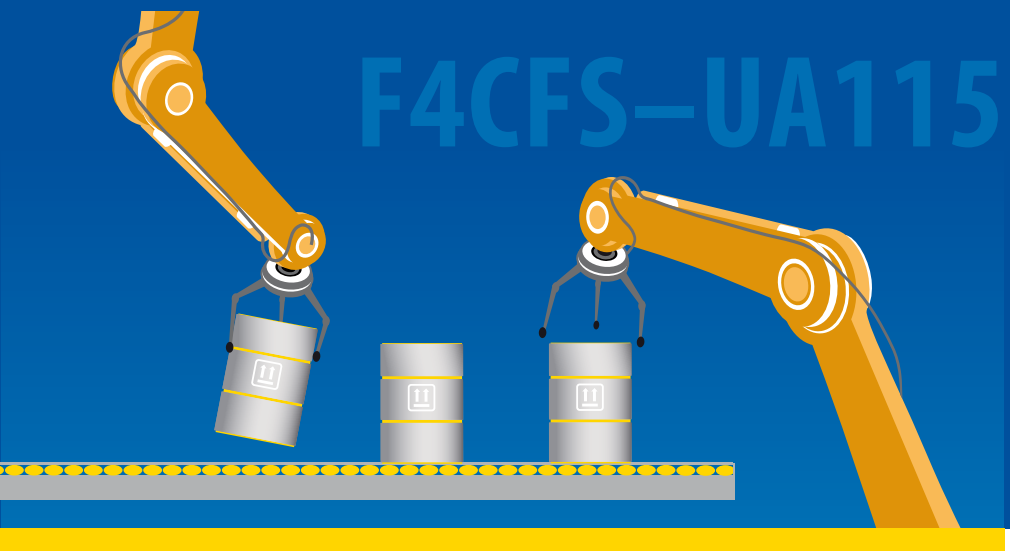
Sumitomo Drive Technologies



Fine Cyclo F4CFS–UA 115

Zero Backlash Precision Speed Reducer for High Loads

Precision Speed Reducer with a high Moment of Stiffness

Precise, with maximum performance and even more reserves: the precision speed reducer type F4CFS-UA 115 has a high level of positioning accuracy and low transmission error, thus making it one of the best speed reducers for use within robot applications in the world, even under maximum dynamic alternating loads.

The special contours of the cycloid disc lobes ensure that the two-stage reduction gear unit operates at low vibration levels, with an optimal distribution of the load forces.

This precision gear type has an outer diameter of 570 mm and operates with the unique and reliable Cyclo principle.

In the UA 115, the cycloid discs for the second gear stage are combined with four spur (involute) gears, which operate as the first stage of a central, toothed input shaft. Each spur gear is combined with an eccentric shaft which rotates two symmetric cycloid discs of the secondary drive stage.

The high degree of overlap between the cycloid disc lobes and the outer pins, as well as the smooth distribution of forces within the gear unit ensures that this compact gear unit achieves a nominal torque up to 16,685 Nm and an acceleration torque of up to 30,000 Nm.

The speed reducer can withstand up to five times it's nominal torque in emergency stop cases. The integrated angular ball bearing allows a bending moment up to 44,000 Nm on the output side, while retaining a moment stiffness of 25,000 Nm/arcmin.

Based on these characteristics, the UA 115 is particularly used in robots, positioning and handling systems - wherever high levels of dynamics and positioning accuracy are required, along with a high, external rotational and tilt momentum and mass moment of inertia.

Precision Speed Reducer

F4CFS–UA 115

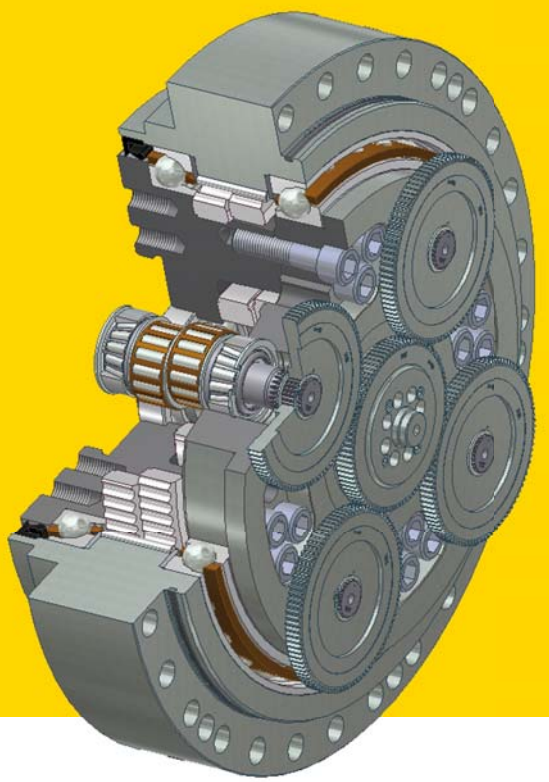
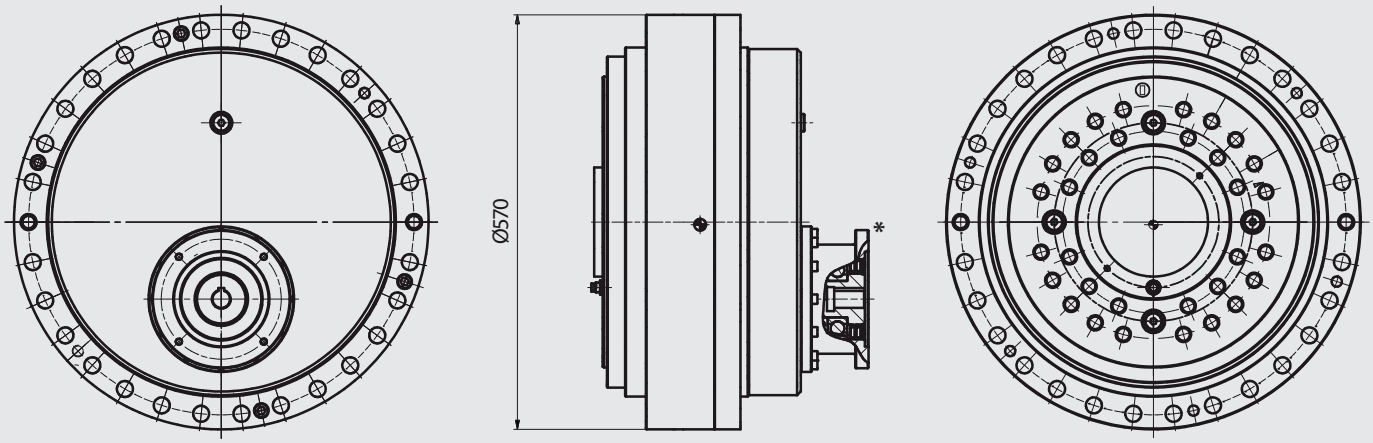


Photo: Sacmi, palletizer

Technical Data F4CFS–UA 115

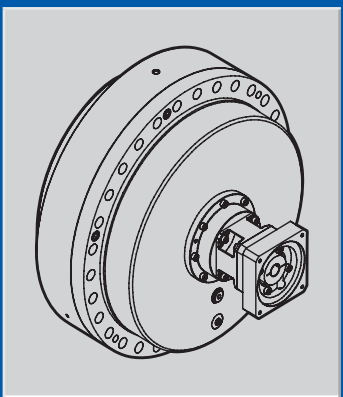
Technical Data F4CFS–UA 115	Unit symbol	Unit	Value
Reduction Cyclo stage	i_{Cyclo}		59
Maximum possible total reduction ratio Fine Cyclo	i_{Basis}		~160
Reduction ratio pre-stage e.g. bevel, planetary or involute	i_{vor}		on request
Total reduction ratio gear unit	i_{ges}		dep. on pre-stage
Rated output torque T_{2N} at n_2= 5 min^{-1}	$T_{2N,5}$	[Nm]	16,685
Rated output torque T_{2N} at n_2= 10 min^{-1}	$T_{2N,10}$	[Nm]	13,552
Rated output torque T_{2N} at n_2= 15 min^{-1}	$T_{2N,15}$	[Nm]	12,000
Rated output torque T_{2N} at n_2= 20 min^{-1}	$T_{2N,20}$	[Nm]	11,008
Acceleration torque	T_{2A}	[Nm]	30,000
Emergency stop torque (3,000 x during lifetime)	T_{2max}	[Nm]	60,000
Moment rating	T_k	[Nm]	44,000
Max. moment rating in emergency case (static)	$T_{k\,max}$	[Nm]	88,000
Allowable axial load (pull)	$F_{2A\,Zug}$	[N]	29,000
Lost Motion	LM φ	[arcmin]	< 0,5
Hysteresis loss	HL φ	[arcmin]	< 0,7
Torsional stiffness at 3 - 100 % T_{2N}	Θ	[Nm/arcmin]	6,000
Moment stiffness (main bearing)	$Θ_1$	[Nm/arcmin]	25,000
Max. output speed	n_{2max}	[min^{-1}]	20
Moment of inertia at input side (without pre-stage)	J_{getr}	[$kgm^2 \cdot 10^{-4}$]	210
Max. outer diameter of gear unit	d	[mm]	570
Weight approx. (dep. on input design)	m	[kg]	260
Maintenance free lubrication			Oil
Mounting position			any
*Motor mounting acc. to customer request			each

Off-set design with involute pre-stage

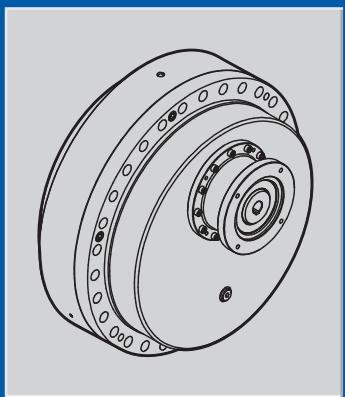


Technical changes reserved

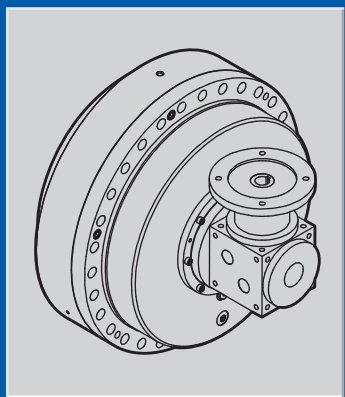
F4CFS-UA115: Flexible Combination Possibilities



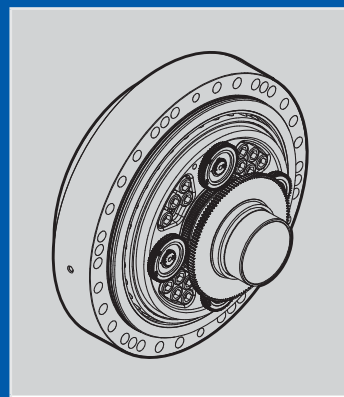
Coaxial design
with
planetary pre-stage



Off-set design
with
involute pre-stage



Right angle design
with
bevel-input pre-stage



Large hollow bore design
with
involute pre-stage

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