9 Questionaire for project work on secondary controls

The following data is required for the dynamic design and simulation calculations of units under secondary control.

9.1 Application details

_____

_____

_____

_____

_____

9.2 Type of closed loop control

9.2.1 Speed control loop

Permissible speed variation Δn:

static $A_3 = \pm$ _____ rpm
dynamic $A_1 = \pm$ _____ rpm

Definition of the parameter to VDI/VDE 2185

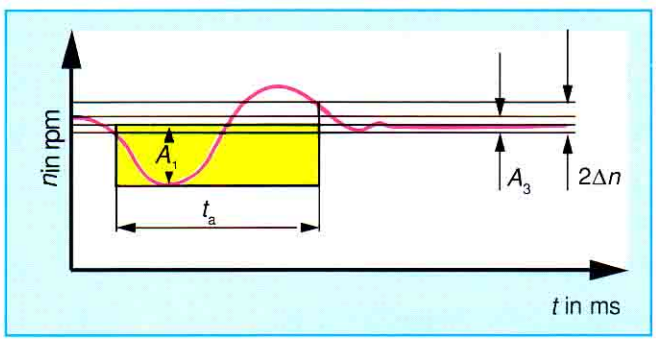

Diagram 10

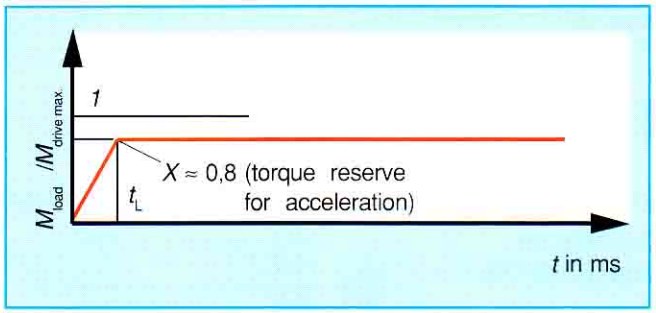

Diagram 11

9.2.2 Torque control

Permissible torque variation ΔM:

static ± _____ Nm
dynamic ± _____ Nm

9.2.3 Positional control

Positional travel _____ ° or _____ mm

Positional accuracy ± _____ ° or _____ mm
(referred to the shaft of the secondary unit)

Holding in the end position against a mechanical stop yes/no

9.2.4 Data for all types of closed loop controls

n_{max} _____ rpm

n_{min} _____ rpm

Acceleration time _____ ms

Deceleration time _____ ms

Max. Torque _____ Nm

Starting torque _____ Nm

Frictional torque _____ Nm

Disturbing torque _____ Nm

Rise time of disturbing torque t_L _____ ms

Time in which this must be regulated out t_a _____ ms

Time in which command value must be regulated out _____ ms

9.2.5 Moments of inertia J

Overall J (not backlash free) reflected to the shaft of the secondary unit $J_{ges\ red}$ _____ kgm²

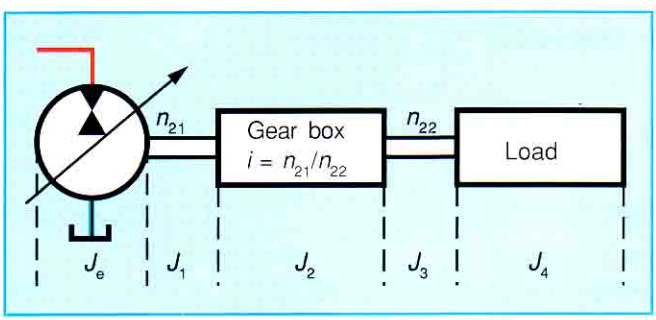

Fig. 66

$$J_{tot.reflected} = J_u + J_1 + J_2 + \frac{(J_3 + J_4)}{i^2}$$

Backlash free reflected moment of inertia J_1 _____ kgm²

Moment of inertia of a cylindrical body:

$$J_{cyl.} = \frac{\pi \cdot \rho \cdot d^4 \cdot h}{32}$$

(ρ in kg/m³, h in m, d in m, J in kgm²)

Units: J (in kgm²) = Weight • Diameter² (in kpm²)/4
J (in kgm²) = Weight • Diameter² (in Nm²) /4 • g

9.3 Axial piston units for secondary control

Max. torque	$M_{t\ max}$	_____	Nm
Nominal torque	$M_{t\ nom}$	_____	Nm
Max. power	P_{max}	_____	kW
at a speed of	n	_____	rpm
Nominal power	P_{nom}	_____	kW
Permissible pressure	p	_____	bar

Details of connecting element (underline the relevant item)
Chain, gearbox, cardan shaft, linkage, belt, gear wheel/ pinion, coupling

Overall torsional stiffness (reflected to the secondary unit)	_____	°/Nm
Total backlash (referred to the secondary unit)	_____	°
Radial loading on shaft F_R = for belts $F_R = F_{torque}$ + pre-tensioning force	_____	N
Offset of F_R to shaft shoulder	_____	mm
For gear boxes i (ratio)	_____	
η_{tot}	_____	%
Backlash (referred to the secondary unit)	_____	°
Torsional stiffness (referred to the secondary unit)	_____	° or Nm
External torque when stationary	_____	Nm
Holding brake		yes/no

9.4 Pressure oil supply (primary unit)

Central oil supply			yes/no
Distance from primary unit to secondary unit		_____	m
How many secondary units can be driven simultaneously at what power?	No. of units	_____	
	Total power	_____	kW
Fluid		_____	
Ambient temperature of cooling medium		_____	°C
Electric motor data:	voltage	_____	V
	frequency	_____	Hz
	speed	_____	rpm
	insulation class IP	_____	

9.5 Accumulator design

Working cycle

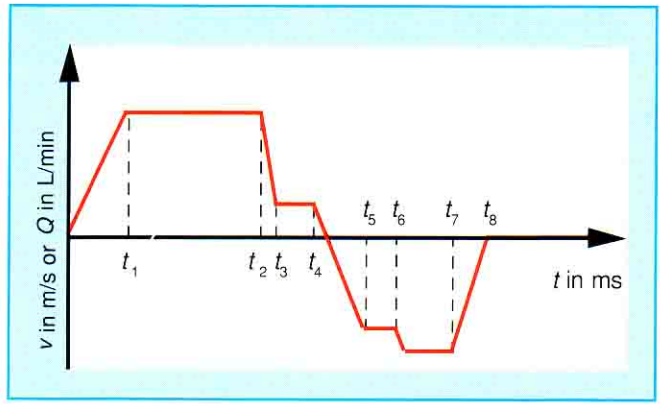

Diagram 12

9.6 Control data

Electric power controls from Mannesmann Rexroth			yes/no
Insulation class	IP	_____	
Installation control and monitoring from Mannesmann Rexroth			yes/no
PLC or		❒	
conventional		❒	
Control voltage		_____	V
Signal level		_____	V
Operation:	local	❒	
	remote	❒	
Ambient temperature		_____	°C
Length of cable between servo valve and control cabinet		_____	m
Must an external machine control also be monitored?			yes/no

9.7 Closed loop electronics

Closed loop electronics from Mannesmann Rexroth		yes/no
Definition of emergency stop	_____	
	_____	

9.8 Standards, specifications and special requirements

_____

_____

_____