

Questionnaire on Governors for Hydro Turbines

Contact name	<input type="text"/>
Company	<input type="text"/>
Street	<input type="text"/>
ZIP/area code, city, township	<input type="text"/>
Country	<input type="text"/>
Phone:	<input type="text"/>
Fax:	<input type="text"/>
E-mail:	<input type="text"/>
 PROJECT NAME	<input type="text"/>

For calculating the size of the governor and all its other data the following information is required on your hydro station. Please attach, if possible, a sketch or drawing of the complete power station to the filled-in questionnaire.

A. Turbine

1. Manufacturer:	<input type="text"/>	
2. Year of construction:	<input type="text"/>	
3. Turbine shaft:	<input type="checkbox"/> horizontal <input type="checkbox"/> vertical	
4. Quantity of turbines:	<input type="text"/>	turb.
5. Head H:	<input type="text"/>	m
6. Water flow by turb.:	<input type="text"/>	m ³ /s
7. max. power output by turb.:	<input type="text"/>	kW
8. Turbine speed:	<input type="text"/>	r.p.m.
9. Francis Turbine:	<input type="checkbox"/> yes <input type="checkbox"/> no	
10. Runner diameter:	<input type="text"/>	mm
11. Mean diameter of spiral casing:	<input type="text"/>	mm

12. Kaplan Turbine:

yes no

13. Height of distributor:

mm

14. Runner adjustable:

yes no

15. Distributor adjustable:

yes no

16.

controls externally internally

17. Free jet turbine:

yes no

18. Number of nozzles:

1 2 3 4

19. Diameter of nozzles:

mm

20. Needle stroke:

mm

21. Runner diameter:

mm

22. Cross-Flow Turbine:

yes no

23. Runner diameter:

mm

24. Width of runner:

mm

25. Quantity of chambers:

1 2 3

26. Work capacity desired:

kpm

B. Penstock (attach plan of penstock course, if possible!)

27. Draft tube length: mm
 28. Diameter: upper part mm lower part mm

29. In the case of different diameters please also specify the same in the following table along with the corresponding lengths. With irregular sections you may also specify areas instead of diameters.

Section	Length [m]	Diameter [mm]	Area [m ²]
Intake	<input type="text"/>	<input type="text"/>	<input type="text"/>
	<input type="text"/>	<input type="text"/>	<input type="text"/>
	<input type="text"/>	<input type="text"/>	<input type="text"/>
Turbine	<input type="text"/>	<input type="text"/>	<input type="text"/>
Total length	<input type="text"/>	<input type="text"/>	<input type="text"/>

30. Max. water flow Q max: m³/s, if turb. in operation only.
 31. Max. water flow Q max: m³/s, if all turb. in operation which are connected to penstock.

32. Water chamber: yes no
 if yes, size: Length: m
 Width: m
 Height: m

33. Penstock material: steel cast iron concrete asbestos cement
 plastic wood

34. Wall thickness:

Section	at intake		at turbine
mm	<input type="text"/>	<input type="text"/>	<input type="text"/>

35. Which pressure increase is permissible at the turbine when full load switched off?

$\Delta H / H$: % ΔH : m water column.

C. Driven Machine, Control Function

36. Turbine runs:

- a) Generator Frequency: Hz Voltage: V
- Synchronous generator
- Stand-alone operation
(autonomous energy production for the supply to an independent grid system)
 - Grid-connected operation
(mains paralleling)
 - Grid-connected + stand-alone operation
(mains paralleling and stand-alone operation)
 - Voltage controller
- Asynchronous generator
(mains paralleling)
- b) Transmission
- Sawmill
 - Mill

37. Which transient speed variations should be observed?

Load change	$\Delta N / N_o$	± 25 %	± 50 %	± 100 %
Speed variation	$\Delta n / n_o$	+ <input type="text"/> %	+ <input type="text"/> %	+ <input type="text"/> %

38. Which proportional variation (statics, permanent irregularity degree) is demanded by you?

max.: % min.: %

39. Existing flywheel mass: G = weight [kp] D = circle diameter [m]

n _o					r.p.m.
G					kp
D					m
GD ²					kpm ²

40. Which shafts can take up additional flywheel mass?

Turbine n_o: r.p.m. | Transmission_o: = r.p.m. | Generator n_o: = r.p.m.

41. Power of largest motor and/or load: kW

D. Arrangement, accessories, extent of quotation

42. Desired / existing voltage: V
43. Desired / existing frequency: Hz
44. Governor as water level regulator with overspeed release (turbine shutdown facility) for asynchronous power stations only: yes no
45. Drawing attached:

Penstock	Turbine	Building	Plant
No.	No.	No.	No.

Should drawings be returned: yes no

Date

Signature

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