

Annexe 2

NEYRPIC® TR10

Electro-hydraulic transducer series

TR10 series electro-hydraulic transducers are generally used to drive the main distributing valve (NEYRPIC D series).

KEY FEATURES

The TR10 series key features are:

- Oil flows up to 30 dm³/min
- Very high sensitivity due to the rotating movement of the spool into the sleeve
- Heavy duty equipment
- Low maintenance requirements
- Long lifetime
- Choice between natural opening or closing tendency
- Pollution tolerance up to 70 µm

DESCRIPTION

TR10 series electro-hydraulic transducers consist of a powerful permanent magnet surrounded by a coil. The movement of the magnet is proportional to the governor electric current in the coil, pulling a small hydraulic slide valve.

The valve moves in front of slots drilled in the main body of the transducer. Depending on its position, the pressurised oil is directed to one of the outlet orifices. The oil flow undergoes a very slight head loss in the transducer and is able to control the main distributing valve which in turn drives the servomotors.

TR10 electro-hydraulic transducers have a spring whose position can be chosen to set the natural opening or closing tendency of the transducer. The choice depends on whether the priority is given to shutdown or to energy production, in the event of loss of control of the electric current.

The TR10 series electro-hydraulic transducers require filtration levels of between 40 to 70 µm compared to a restrictive 5 to 10 µm for other similar products available on the market. This helps to reduce maintenance operations and to increase plant reliability when oil quality has deteriorated, something that frequently occurs in hydropower plants.

MAINTENANCE

The TR10 transducer is a key hydraulic part in the turbine speed governing system. Its availability must be guaranteed at all times during the lifetime of the power plant. In reply to this, Alstom Hydro prioritised decisive features requested by customers such as reliability and the need for heavy duty equipment when developing the TR10 series.

Alstom Hydro electro-hydraulic transducers are therefore characterised by their long lifetime and very limited maintenance requirements. For example, the Alstom Hydro electro-hydraulic transducer maintenance manual only recommends a preliminary technical check of the TR10 after 100,000 operating hours.

COMPATIBILITY

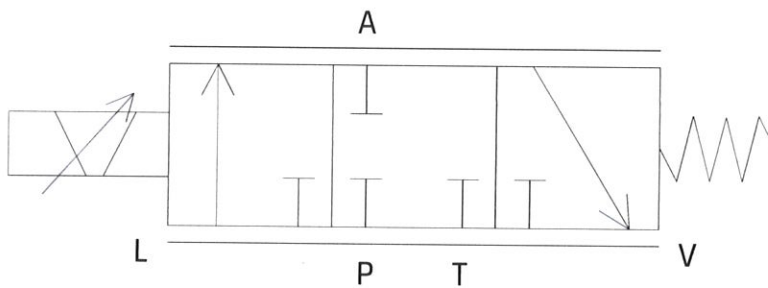
The TR10 is compatible with all Alstom electronic speed governors, from the former NEYRPIC RT81, right through to the most recent NEYRPIC T.SLG range. This is a key advantage particularly for refurbishment projects as it only necessitates replacing the electronic part of the T.SLG while keeping all the hydraulic parts (the valves and other hydraulic devices).



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TECHNICAL CHARACTERISTICS

ITEM	DATA	TR10
Type		3-way
Spool	Diameter (mm)	10
Coil	Resistance (Ω)	25
	Maximum current (A)	0.8
Operating pressure (bar)	Maximum	160
	Minimum	10
Maximum flow (at 30 bar ΔP)	dm ³ /min	30
Maximum leakage rate (dm ³ /min)	At equilibrium at 60 bar 68 Cst	1.6
Oil filtration (μm)	P > 70 bar	40
	P < 70 bar	70
Size (mm)	Diameter	155
	Height	250
Weight (Kg)		24



PORTS:

- A : "Opening"
- L : Leaks
- P : Supply
- T : "Opening" drainage
- V : Hydraulic jet drainage

TR10

φ170

28
30
210
18
340
74
79
130
60

9

1

F6

6

7

F5

F4

φ190

2

F2

F1

F3

5

4

3

φ180

F3

φ146

Fuite
d'équ

Au S
d'équ

au
servomoteur

au
huile sous
pression

Arriv
d'éq

(En

Eva
male

φ110

φ112

avant
roulement



TR 10

