

A device for controlling perfusion pressure

D.C. CARDINAL & T.W.K. HILL
(introduced by J.M.G. WALKER)

Pharmacology Laboratory, Wellcome Research Laboratories, Langley Court, Beckenham, Kent BR3 3BS

A control unit has been developed for the perfusion of vascular beds. It will maintain a chosen constant

arterial pressure or the manually preset, constant pressure, enables the difference to be detected and amplified. This difference is fed into an integrating amplifier, the output of which provides a voltage for controlling the pump via its own control circuit.

The instrument is an improvement on previous electronic designs (Lowe, 1966; Critchley, Ungar & Whelpdale, 1974) in that it is compact and easy to operate and allows the pump to operate over its full speed range. It is also an improvement on the Starling pneumatic resistance method (Ono, Kokubun &

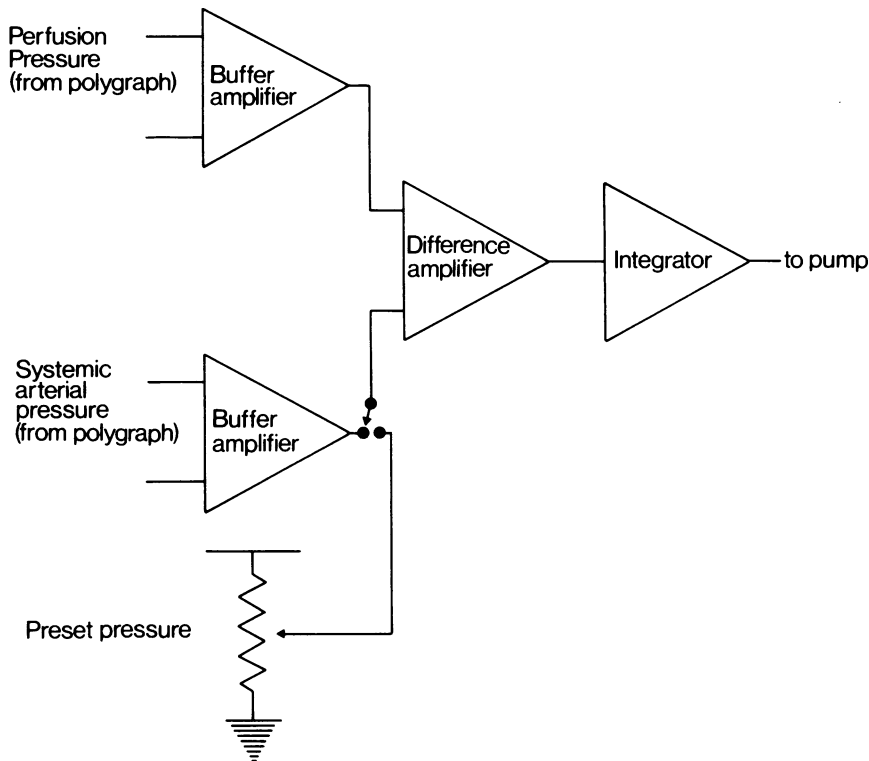


Figure 1 Control unit.

perfusion pressure or cause it to follow variations in systemic arterial pressure. The control unit (Figure 1) is used in conjunction with a polygraph (Beckman R411) for recording systemic arterial and perfusion pressures and a roller pump (Watson-Marlow, MHRE 200).

Voltages transduced from the recorded pressure signals are taken from the polygraph pre-amplifiers and fed into buffer amplifiers to prevent any interaction between the control unit and the polygraph. Comparison between the voltages derived from the perfusion pressure and either the systemic

Hashimoto, 1974) as it does not require cannulation of an extra vessel for the shunting of blood.

References

- CRITCHLEY, J.A., UNGAR, A. & WHELPDALE, P.H. (1974). A feed-back amplifier for constant pressure perfusion with a roller pump. *Br. J. Pharmac.*, **52**, 155P.
- LOWE, R.D. (1966). A constant pressure variable flow blood perfusion system. *J. Physiol. (Lond.)*, **186**, 45P.
- ONO, H., KOKUBUN, H. & HASHIMOTO, K. (1974). Abolition by calcium antagonists of the autoregulation of renal blood flow. *Naunyn-Schmiedeberg's Arch. Pharmac.*, **285**, 201–207.