A very important "Technical Questionnaire" about our SERVOWATT Operational - Power - Amplifiers

It is necessary to understand that our discrete made amplifiers react differently as integrated IC´s like the old µA741. Due to stages with higher amplification we achieve factors to over 50V/µV. Then you can see that with no feed-back +/-1 microvolt at the input would mean +/-50V at the output. Therefore it is necessary to reduce the total internal amplification by a proper - so called - feed-back. This is a very tricky task that should not be given to the customer. In some cases we should deliver the unit with a set of approximated circuits to the customer in order the unit could be further adapted from him to some extent. Please name us in detail the most important points of your application in order we have an overview over your desired solution.

1. Bipolar input and output: Our standard units work +/- or "bipolar", but we also have in the mean time also some special "unipolar" units using only one positive or negative power supply. Please name your wishes.

2. Describe your application: 1.Voltage amplification, 2.Voltage controlled current sources 3. servo-system:
   A normal "Voltage Amplifier" has very low internal impedance at the output and acts to be extremely stable against varying, different loads. *But the voltage amplifier does not accept capacitive loads*, this is a typical case where we should "compensate" that unit for the customer, because the amplifier could oscillate !!!
   A "Voltage Controlled Current Source" does the opposite: It has at the output an infinite high impedance, that means, that the current will stay stable with varying loads ! The optimal compensation should to be found by us, because the client has normally not the knowledge to find these optimised circuits.
   A so called "Servo-System" will stabilize the speed of DC-servomotor with the voltage of a coupled voltage DC-tachometer, that acts as a stabilizing speed sensor, there are many other possibilities for servo systems like a current servo system = a torque servo that stabilizes torque but leaving the speed to adjust freely. Other typical servos will stabilize perfectly an angle, a force, a position or any physical measurable value.

3. Polarity or Phase between Input and Output: Inverting or not inverting the output voltage? Inverting is always to be preferred for a general higher stability of any circuit especially against oscillations. This is the reason why in feedback control theory the inverting circuits are always preferred! Please use whenever possible the so called inverting amplifier configuration !

4. There is a third way to design a circuit by using a double, differential input circuit. *In these special cases we have 2 different input voltages against ground voltage*. These special circuits are of course more complicated to adjust than a simple inverting or not-inverting feedback circuit. Differential input circuits are a special task that we do manage for our customers. We try to satisfy all wishes of our customers.

5. Input control voltage: Customers normally prefer from 0V to +-10V as standard. If the customer wants by any means any other voltage, we will fulfil these wishes. We could also offer even a special input current.

6. The price we demand for the circuits design depends on the circuit accuracy. Normally, current circuits are more expensive than voltage circuits and reflect the typical engineering efforts of our engineer. It is not so easy to achieve 1% accuracy or even 0,1%. This takes valuable time for an engineer who has also to adjust the proper bandwidth and solve other special details. Our expertise is great and our prices are very decent.
   Voltage amplification: +-2% € 90,-- +-1% € 140,-- +-0,1% € 180,--
   Current sources +-2% € 150,-- +-1% € 190,-- +- 0,1% with special trimmed 4-pole-shunts € 280,--

7. Frequency range is desired from ……..Hz to ……..kHz, signal shape is sine, triangle or square wave? Please name clearly your special wishes and add a diagram to explain these with no misunderstanding.

8. The load at the output is resistive, inductive or *capacitive* These C- loads are always extremely critical in Voltage Amplifiers! Please name us the appx. values, this is important! There are also complex loads with stubborn resonances, which may be sometimes difficult to handle. If the load is not explained in detail we could encounter surprises.

9. A clear explanation of the application would be very helpful. What is the most important point for you ?

10. Number of units:

We are often asked about other housings, but these and special mechanics are rather not our speciality.

We try to deliver our customers the most simple and easy solutions and take care that you as our customer do not commit any mistakes that could become very costly for you. Our expertise as physicists, specialists in electronics and also in chemistry has shown in the past to be very valuable for our customers.

Some customers want to receive our signed "Non-disclosure-agreement", no problem at all with that.

Please send this completed document to e-mail = renz@servowatt.de

Your name: Company: Date: