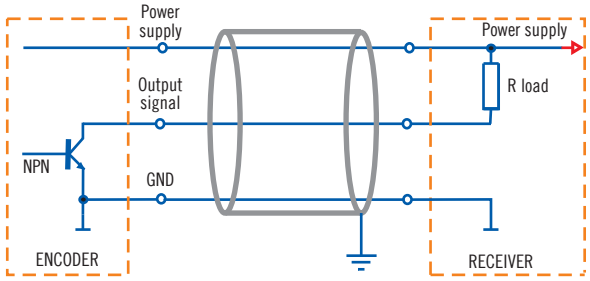
OUTPUT CONFIGURATIONS

ISO 9001:2000

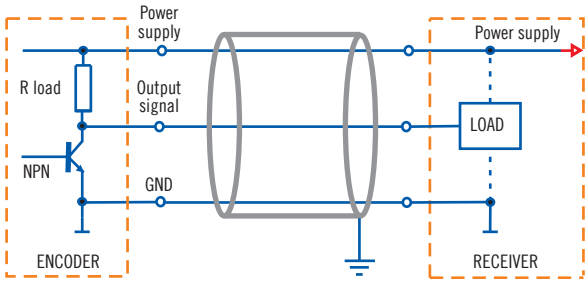
NPN AND NPN OPEN COLLECTOR ELECTRONIC

It is composed only by an NPN transistor and a pull-up resistor used to match the output voltage to the power supply when the transistor is quiscent. From the electrical point of view it is similar to TTL type logic and so it is considered compatible. If used correctly, it shows low saturation levels at 0 Vdc and close to 0 at the positive. It is proportionally influenced by the cable length, pulses frequency and by the load.
Please consider these specs for a proper use. The open collector variant is different for the lack of the pull-up resistor, freeing in such way the transistor collector from the tie of the encoder power supply allowing to obtain signals with different voltage.

NPN OPEN COLLECTOR



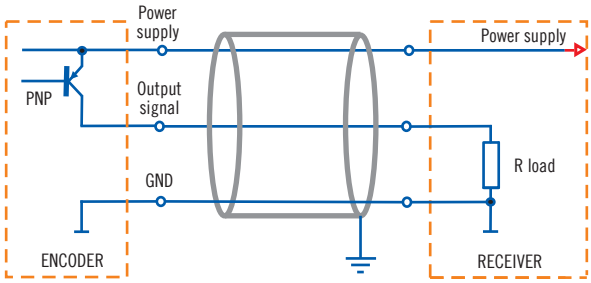
NPN



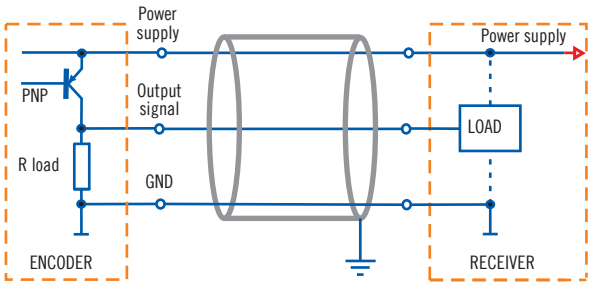
PNP AND PNP OPEN COLLECTOR ELECTRONIC

Main characteristics and limitations are the same as for NPN electronics. Main difference is the transistor, which is of PNP type and is constrained to the positive. The resitor, if present, is a pull-down one. Therefore, it is connected between the output and zero Vdc.

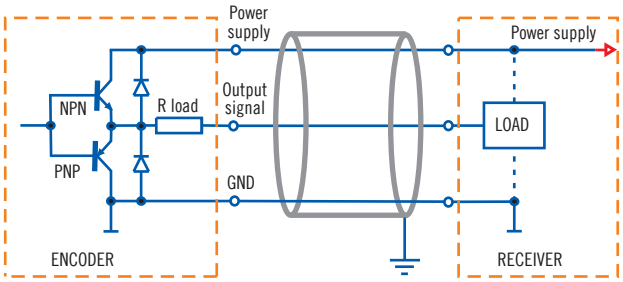
PNP OPEN COLLECTOR



PNP



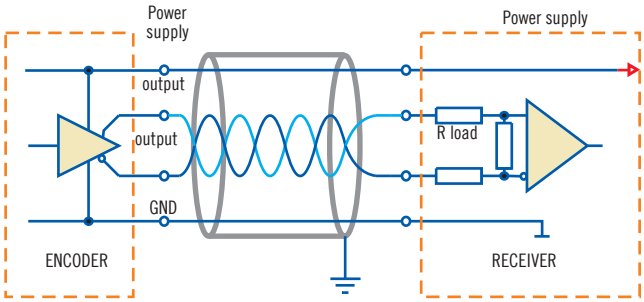
PUSH-PULL



PUSH-PULL ELECTRONIC

Electronic featuring high performances. NPN or PNP major limitations are caused by the resistor, which works with a much higher impedance than a transistor. To overcome this issue, push-pull electronic uses a complementary transistor, so the impedance is lower for commutation to positive and to zero.
This solution increases frequency performances allowing longer cable connections and an optimal data trasmission even at high working speed. Saturation signals are low but sometimes higher than in NPN and PNP electronics. Anyway, PUSH-PULL electronics is in any case indifferently applicable instead of NPN or PNP.

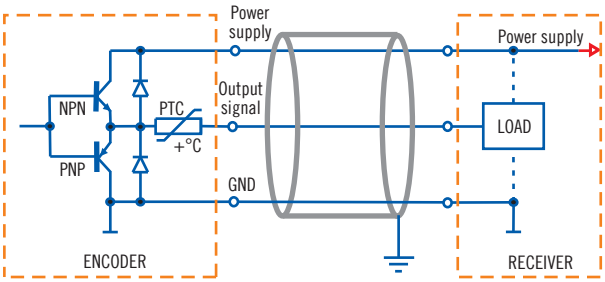
RS 422

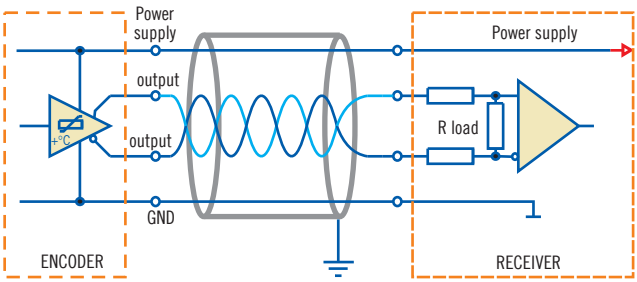


RS 422 ELECTRONIC

LINE DRIVER is used when operating enviroments are particulary exposed to electrical disturbances or when the encoder is quite far from the receiver system. Data trasmission and receiving work on two complementary channels so disturbances are limited (they usually come from other cables or close machinery). These interferences are known as «common way disturbances» as their generation is due to a common point: the system mass.
Instead, in LINE-DRIVER transmetted and received signals work in «differential» way. In other words, it works basing the communication on voltage differences between complementary channels. Therefore it is not effective to common way disturbances. This type of transmission is used in 5 Vdc systems and it is also known as RS422 compatible. It is available with power supplies up to 24 Vdc.

PROTECTIONS





PROTECTION FOR OUTPUT STAGES

Two different kind of electronic protection against short circuits might be used: the passive one (using fuses, no linear resistors, etc.) and active one (using transistors). Eltra's encoders can be equipped with both type of protection against short circuits.

Passive protection
Passive solution is the cheapest one. It is used to avoid accidental short circuits, which rarely happens. The component which carries out the protection is called PTC. It is a resistor that, if crossed by a voltage exceeding the supposed one, increases its resistance to limit electricity exceedance. Limitations of this kind of protection concern the low reacting speed, which may progressively stress the components under protection. Therefore, this protection is effective against a limited number of short circuits and it is available only for NPN, PNP, and PUSH-PULL electronics.

Active protection
This solution is based on a circuit integrated in the electronic output which costantly controls the temperature reached by the element to be protected. In this way, protection is very effective and the reacting speed very high. Moreover, it ensures a constant protection against repetitive and permanent short circuits, that is why is strongly suggested for heavy usages. It is available only for LINE-DRIVER and PUSH-PULL electronics.

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