

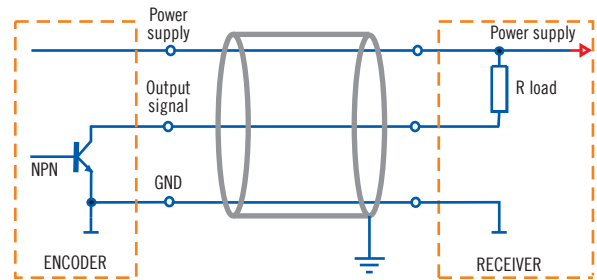
NPN AND NPN OPEN COLLECTOR ELECTRONIC

It is composed by an NPN transistor and a pull-up resistor used to match the output voltage to the power supply when the transistor is off.

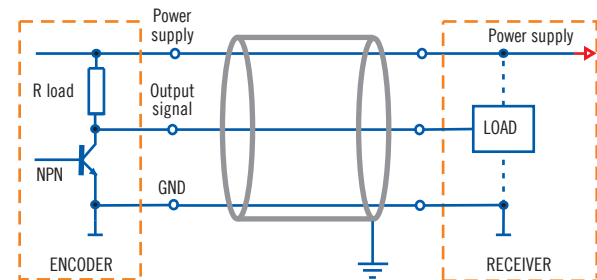
It has low saturation levels at 0 Vdc and close to 0 at the positive. It is proportionally influenced by the cable length, pulses frequency and by the load.

Please consider these specs for a proper use. On the open collector variant there's no 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

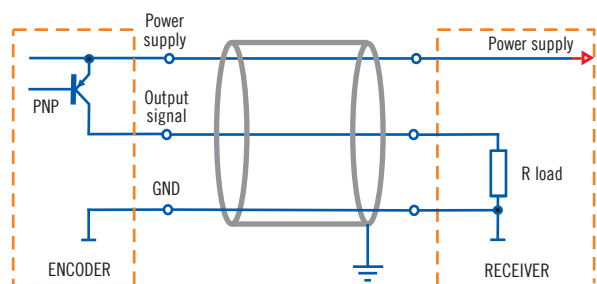


PNP AND PNP OPEN COLLECTOR ELECTRONIC

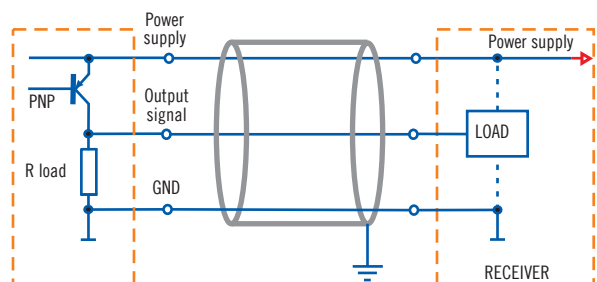
Main characteristics and limitations are the same as for NPN electronics. Main difference is the transistor, which is a PNP type. The resistor, if present, is a pull-down one.

Therefore, it is connected between the output and 0V.

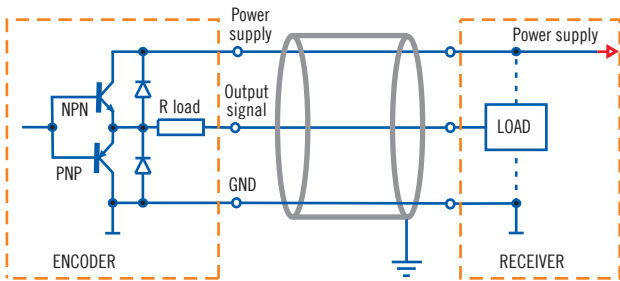
PNP OPEN COLLECTOR



PNP



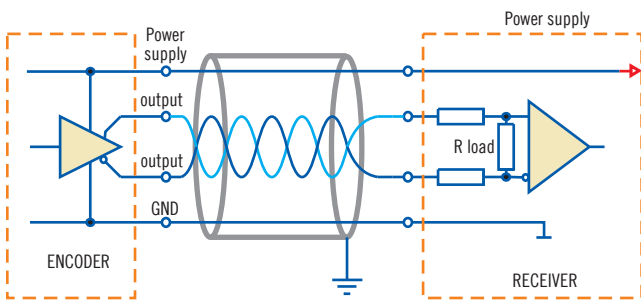
PUSH-PULL



PUSH-PULL ELECTRONIC

In 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 transmission 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.

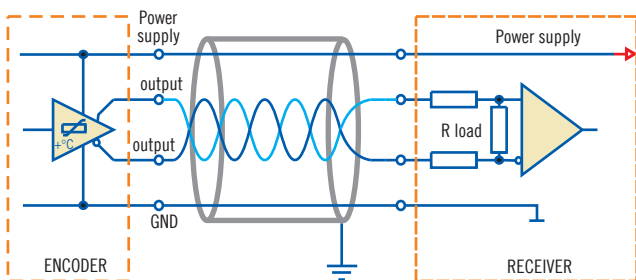
LINE DRIVER



LINE DRIVER ELECTRONIC

LINE DRIVER is used when operating environments are particularly exposed to electrical disturbances or when the encoder is quite far from the receiver system. Data transmission and receiving work on two complementary channels so disturbances are limited (cross talk from other cables). These interferences are known as «common mode disturbances» as their generation is due to a common point which is 0V. Instead, in LINE-DRIVER transmitted and received signals are 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. It is available also with power supplies up to 24 Vdc.

PROTECTIONS



OUTPUT STAGE PROTECTION

A highly integrated ASIC is used to protect outputs from short circuits. This solution is based on an active sensor which controls instantly the temperature reached by the element to be protected. In this way, protection is very effective. Moreover, it ensures a constant protection against repetitive and permanent short circuits, that is why is strongly suggested for heavy usages. It is available for LINE-DRIVER and PUSH-PULL electronics.

ENCODER CABLE LENGTH

Based on the power supply, electronic interface and output frequency maximum cable length are as below tables:

Incremental encoders			
Power supply (Vdc)	Electronic interface	Frequency (kHz)	Max cable length (m)
5V	Line driver RS422	50	300
5V	Line driver RS422	100	200
5/28V - 8/24V	Line driver	50	80
5/28V - 8/24V	Line driver	100	40
5/28V - 8/24V	Push-pull	50	60
5/28V - 8/24V	Push-pull	100	30

System setup: ambient temperature (20°C), load current 20 mA , Eltra AWG24 shielded cable.

Absolute encoders			
Power supply (Vdc)	Electronic interface	Frequency (kHz)	Max cable length (m)
8/28V	Push pull Parallel	25	100
5V - 8/28V	SSI	100	300
5V - 8/28V	SSI	200	200
5V - 8/28V	SSI	400	50
5V - 8/28V	SSI	1000	10
12/28V	Analogue (current)	-	200

Depending on the application, maximum cable length might be shorter, particular eg: where a high level of electrical noise is present. Please carefully select the power supply core diameter. Its size should be big enough that encoder voltage is inside working parameters as specified within the product datasheet.

Use always shielded cables, for further details or informations please directly contact our offices.