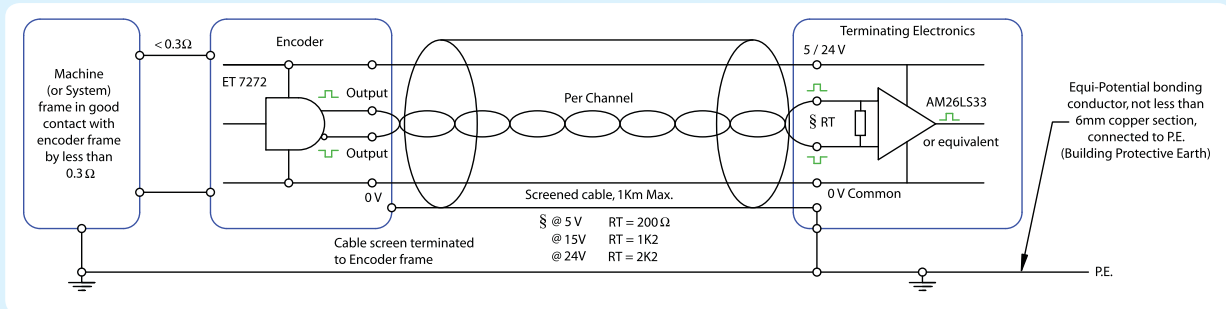


HV Including RS422, RS485, TTL, HTL, NPN, PNP (A, \bar{A} , B, \bar{B} , Z, \bar{Z})

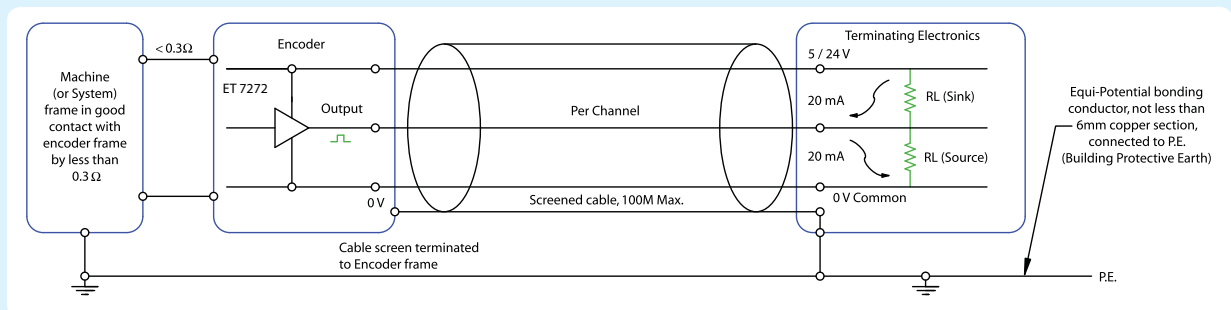
This UNIVERSAL HIGH VOLTAGE OUTPUT DRIVER may be used in either single ended or differential mode. In differential mode, the HV driver will function as an RS422 driver, a TTL driver, or an HTL driver. In single ended mode (i.e. without the complement signals), it will function as a current sink driver (NPN), a current source driver (PNP), or as a Push-Pull driver.

The driver will operate throughout a wide voltage range, from 4.75V through 28V, and has internal over-current protection. Each leg of each channel is also protected by a Schottky Diode. All screens should be terminated to P.E. (building protective earth) at each end. **It may also be necessary to provide an equi-potential bonding conductor between all parts of the machine or system in order to maintain a 0V potential difference to P.E.**



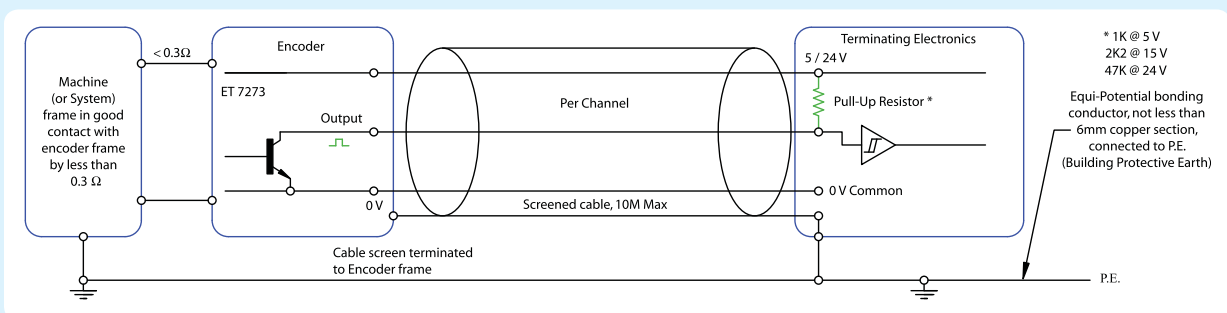
PP Push-Pull (A, B, Z)

The output driver is simply the HV UNIVERSAL HIGH VOLTAGE OUTPUT DRIVER configured without the complement signals. It will equally Sink or Source up to 20 mA per channel. All screens should be terminated to P.E. (building protective earth) at each end. **It may also be necessary to provide an equi-potential bonding conductor between all parts of a machine or system in order to maintain a 0V potential difference to P.E.**



OC open collector (A, B, Z)

This NPN Open Collector driver is capable of sinking up to 50 mA per channel and (in MOST models) is also capable of providing a complement signal which may be employed as an extra or redundant circuit. All screens should be terminated to P.E. (building protective earth) at each end. **It may also be necessary to provide an equi-potential bonding conductor between all parts of a machine or system in order to maintain a 0V potential difference to P.E.**



Electro Magnetic Compatibility, EC Directive 89/336/EC

All of our products have been CERTIFIED by an INDEPENDENT TEST HOUSE to ensure that each type will fully integrate into systems or machines requiring EMC certification.

Since JAN 2001, 1996, Encoders fitted with a flying lead HAVE THE CABLE SCREEN IN CONTACT WITH THE ENCODER FRAME. The purpose of this is to ensure total shielding of the encoder electronics by virtue of its metallic body and cover, all of which will be bonded together and terminated to the screen.

The user should ensure that the component parts of the machine, or system frame, are at the SAME POTENTIAL (FRAME/GROUND/EARTH/SIGNAL GROUND/PE), if necessary, by bonding together by means of a copper "EQUI-POTENTIAL BONDING CONDUCTOR" of at least 6mm section to the P.E. (building protective earth).

For Encoders fitted with a connector, WHEREVER POSSIBLE, we will fit a "case ground" to one of the connector pins; this will be in contact with THE ENCODER FRAME.

RS422 differential drive should be employed wherever possible. Always use sensible cabling practice by separating encoder signal cable routing from other devices, if necessary, by use of grounded separators or trunking. Use twisted pair cables with an overall BRAIDED screen, e.g. BELDEN 9807 or equivalent.

The RXTX module can help to solve most problems when transmitting encoder signals over long lengths of cable.

Waveform Timing

These output waveform timing diagrams illustrate the relationship of output A, B, and index. Quadrature separation (right) is typically 90 electrical degrees with a tolerance of 10%, giving minimum edge separation of 72°e. Output A leads B for clockwise rotation of the encoder shaft. For NPN output \bar{A} , \bar{B} , and \bar{Z} will not be present. For some types the marker pulse can be gated $Z \cdot A$, $Z \cdot B$, $Z \cdot A \cdot B$.

Note:-

These Signal configurations were obtained from a clockwise turning shaft (viewed from the shaft end) with the oscilloscope triggering on the negative edge of Output A with scope channel 1, and Output B or Output Z on scope channel 2

