## ABB Ex motors and drives The selection process flow

Motors are directly connected to the machines in the potentially explosive atmosphere. All products that are installed in potentially explosive atmosphere must be certified by an approved certification body.

Frames R10 → can have 500 m cable

Drives are always installed outside of the potentially explosive atmosphere. Hence drives are not Ex certified, but the safety functions in the drives are ATEX certified. The combination of ABB motor and ABB drive are certified as well (IECEx/ATEX).

www.abb.com/drives Standard **ATEX Directive** Main motor Installation zone acc. to **Sustomer input** Globally, a "Zone" system is used to classify potentially explosive IEC 60079-0 IEC 60079-10-x 2014/34/EU (former directive 94/9/EC) protection EN 60079-0 EN 60079-10-x types areas. The Worker Protection Directive 1999/92/EC and the Equipment group | Equipment category EPL Protection level Group international standards IEC 60079-10-x, EN 60079-10-x define The Zone classification is Requirements according to these Zones. In all cases, Zone classification is the responsibility I (Mines) not used in mines. M2 EN 1127-2 of the owner of the site where the potentially explosive very high No electric motors allowed atmosphere exists. 2G Ex d/Ex de, Ex p, Ex e high 3G Ex nA The correct Ex motor can be chosen based on the EPL/protection II (Surface) 20 1D No electric motors allowed level or product category required using the table on the right. (Dust) 2D Ex tb IP 65 21 22 3D Ex tc, IP 65/IP 55 enhanced non-ABB Ex motor ABB Ex motor Selection of motor and drive ABB drives tested with ABB Ex motors ABB drives not tested with ABB Ex ABB Ex motor with Non ABB drive Non-ABB Ex motor with ABB drive ACS880, ACS800 and ACS550 motors **ALL ABB DRIVES ALL DRIVES** Certifications available NON TESTED DRIVES Motor thermal sensor (+813) and Motor thermal sensor and Safety functions not required but Motor thermal sensor (+813) and Certified PTC/Pt100 relay and Certified PTC/Pt100 relay and available: Certified PTC/Pt100 relay needed Drives main contactor needed Additional safety needed **ACS880:** +Q971 The ABB drives are able to limit the The VSD must be able to limit the Additional safety function needed ACS880/ACS800 cabinet/multidrives: switching frequency switching frequency +L513/L514 and +Q971 **DriveSize tool** Manual sizing Dimensioning The tool calculates correct Motor is selected by calculating the needed torque in duty point for applicable speed range and choosing the right drive accordingly. drive and motor. Follow motor Load capacity curves manufacturer's instructions Drive filters ≤ IEC 250 No filter needed filters ≤ 600 V Selection of motor winding insulation and converter output Follow motor manufacturerer's and filters as well as elimination of ABB drives' instructions bearing currents for ABB Ex ABB special insulation (variant code 405) ≤ IEC 250 motors and drives. du/dt filter IEC 355 - 450 du/dt filter, common mode filter No filter needed ABB special insulation Insulated bearing Insulated bearing The maximum motor cable length for Cable types Cable types Cables and EMC DTC control in ACS880 varies by frame for drive input for motor size. Follow ABB Motors and drive Follow motor manufacturer's manufacturer's cable and EMC and ABB drives' cable and EMC Frames R1 - R3 can have 150 m cable PE 000 recommendations recommendations Frames R4 - R9 can have 300 m cable