



## INSTALLATION INSTRUCTIONS FOR QX-P RANGE OF Ex e TERMINAL BOXES

THIS APPARATUS IS DESIGNED FOR USE IN HAZARDOUS LOCATIONS AND IS MANUFACTURED IN ACCORDANCE WITH EUROPEAN STANDARDS EN 60079-0:2006 AND EN 60079-7:2007.

### SPECIFICATIONS

|                                |  |
|--------------------------------|--|
| MANUFACTURER:                  | Quintex GmbH   |
| ENCLOSURE TYPE:                | QX-P..   |
| ENCLOSURE MATERIAL:            | GLASS REINFORCED POLYESTER   |
| MINIMUM OPERATING TEMPERATURE: | -50°C  |
| MAXIMUM OPERATING TEMPERATURE  | +40°C T*=T6 T**=T80C<br>+55°C T*=T5 T**=T95C<br>+60°C T*=T4 T**=T130C<br>+50°C T*=T6 T**=T80C                                    |
| IP RATING:                     | IP65   |
| CERTIFICATE NUMBER:            | EPS09ATEX1237  |
| TESTING STATION NO.:           | 2004   |
| INCREASED SAFETY MARKING:      |  II 2 GD Ex e IIC T* Gb<br>Ex tb IIIC T**°C Db  |
| INTRINSIC SAFETY MARKING:      |  II 2 GD Ex ia IIC T* Ga<br>Ex tb IIIC T**°C Db |
| MAXIMUM VOLTAGE AND CURRENT:   | DEPENDENT ON TYPE OF TERMINALS FITTED  |

THE TABLE BELOW GIVES THE MAXIMUM AMOUNT OF POWER THAT MAY BE DISSIPATED WITHIN A PARTICULAR SIZE OF ENCLOSURE SUCH THAT THE TEMPERATURES ACHIEVED FALL WITHIN THE LIMITS OF THE ABOVE TEMPERATURE CLASSES.

| ENCLOSURE SIZE (NORMAL & DEEP VERSIONS) | MAXIMUM DISSIPATED POWER (W)<br>FOR T6@+40°C / T5@+55°C /<br>T4@+60°C | MAXIMUM DISSIPATED POWER (W)<br>FOR T6@+50°C |
|---|---|--|
| QX-P1                                   | 7.5   | 1.6  |
| QX-P2                                   | 8   | 2  |
| QX-P3                                   | 9   | 3  |
| QX-P4                                   | 9   | 3  |
| QX-P5                                   | 9.4   | 3.5  |
| QX-P6                                   | 9.4   | 3.5  |
| QX-P7                                   | 10.4  | 4.3  |
| QX-P8                                   | 12  | 5  |
| QX-P9                                   | 13.8  | 6.2  |
| QX-P11/QX-P11h                          | 15.5  | 6.4  |
| QX-P12/QX-P12h                          | 15.5  | 6.4  |
| QX-P15/QX-P15h                          | 31.4  | 11.2   |
|   |   |  |
|   |   |  |

## INSTALLATION

TO MINIMISE THE RISK OF IGNITION BY ELECTRICAL APPARATUS IN HAZARDOUS AREAS EFFICIENT INSTALLATION, INSPECTION AND MAINTENANCE OF APPARATUS AND SYSTEMS IS ESSENTIAL AND THE WORK SHOULD BE CARRIED OUT BY SUITABLY TRAINED PERSONNEL IN ACCORDANCE WITH THE PREVAILING CODE OF PRACTICE.

## MOUNTING

THE ENCLOSURES HAVE MOUNTING HOLES (TO SUIT 6mm MAX. SCREWS) THROUGH THE BOX BASE OUTSIDE THE ENCLOSURE COVER GASKET THUS NOT REDUCING THE INGRESS PROTECTION AND ARE PROTECTED BY THE COVER AFTER INSTALLATION. TO ASSIST MOUNTING THE ENCLOSURES HAVE THE REQUIRED MOUNTING HOLE SPACING DIMENSIONS MOULDED INTO THE REAR FACE.

## POWER DISSIPATIONS

IT IS IMPORTANT TO UNDERSTAND THAT TO ACHIEVE THE TEMPERATURE CLASSES STATED IN THE ABOVE SPECIFICATION, TWO CRITERIA MUST BE MET:

1. THE TOTAL POWER DISSIPATED IN THE ENCLOSURE IS LESS THAN THE SPECIFIED FIGURE.
2. THE POWER IS DISSIPATED EVENLY THROUGHOUT THE ENCLOSURE SUCH THAT NO HOT SPOTS FORM.

IN A JUNCTION BOX MOST OF THE DISSIPATION ARISES FORM CURRENT FLOWING THROUGH THE LENGTHS OF CABLE WITHIN, RATHER THAN FROM THE TERMINALS THEMSELVES. TO CALCULATE THE DISSIPATION IT IS NORMAL TO ALLOW FOR A WORST CASE LENGTH OF WIRE GOING IN TO EITHER SIDE OF EACH TERMINAL, I.E. USE THE LENGTH FROM DIAGONALLY OPPOSITE CORNERS. THE RESISTANCE OF THIS LENGTH OF WIRE MAY BE CALCULATED USING DATA FROM THE CABLE MANUFACTURER. THE AMOUNT OF HEAT GENERATED MAY THEN BE DETERMINED USING THE FORMULA  $I^2R$  WHERE I IS THE CURRENT IN THAT CIRCUIT AND R IS THE RESISTANCE OF THE TOTAL LENGTH OF CABLE WITHIN THE ENCLOSURE ASSOCIATED WITH THAT TERMINAL. IF THERE ARE A NUMBER OF DIFFERENT CABLE SIZES AND CURRENTS IN THE ENCLOSURE THE CALCULATION MAY NEED TO BE PERFORMED A NUMBER OF TIMES TO CALCULATE THE TOTAL FIGURE.

TO AVOID HOT SPOTS IT IS NECESSARY TO ENSURE THAT AS FAR AS POSSIBLE CABLES ARE NOT BUNCHED TOGETHER. THIS IS ESPECIALLY IMPORTANT WHERE HIGH CIRCUIT CURRENTS ARE FLOWING THROUGH RERLATIVELY SMALL CROSS SECTION CABLES. PROPER TIGHTENING OF ALL TERMINALS ENSURES THAT A GOOD CONTACT IS MADE BETWEEN THE CONDUCTOR CORE AND TERMINAL, SINCE POOR CONNECTIONS MAY ALSO CREATE HOT SPOTS.

**IT IS VERY IMPORTANT THAT THE ABOVE ADVICE ON POWER DISSIPATIONS IS ADHERED TO - THE INCREASED SAFETY PROTECTION CONCEPT RELIES ENTIRELY ON THE AVOIDANCE OF ARCS AND CONTROLLING THE TEMPERATURE OF SURFACES. QUINTEX GmbH TAKES NO RESPONSIBILITY FOR ENCLOSURES NOT MEETING THE STATED HAZARDOUS AREA SPECIFICATIONS WHEN USED OUTSIDE THEIR STATED DISSIPATION LIMITS!**

## ELECTRICAL CONNECTIONS

THE FOLLOWING INFORMATION IS GIVEN AS A GUIDE FOR TYPICAL JUNCTION BOX INSTALLATION. HOWEVER, IT SHOULD BE APPRECIATED THAT THE INSTALLER AND USER MAY NEED TO APPLY ADDITIONAL MEASURES IF THE PARTICULAR APPLICATION/LOCATION/LOCAL CODES OF PRACTICE REQUIRE SO.

1. THE TERMINALS FOR Ex e MUST BE COMPONENT CERTIFIED AND EACH INDIVIDUAL TERMINAL SHOULD CARRY THE CERTIFICATE REFERENCE. TERMINALS FOR Ex ia ARE SUPPLIED IN A BLUE MATERIAL.

2. IF EXTRA TERMINALS ARE REQUIRED SPECIFIED CREEPAGE AND CLEARANCE DISTANCES FOR THE TERMINALS MUST BE MAINTAINED AND THE DISSIPATED POWER RATING SHOULD BE RE-CHECKED.
3. THE CONDUCTOR SIZE MUST NOT EXCEED THE DESIGNATED SIZE FOR THE TERMINAL AND THE CERTIFIED RATING LIMITS SHOULD BE OBSERVED.
4. ONLY ONE CONDUCTOR PER TERMINAL CLAMP IS NORMALLY PERMITTED.
5. CONDUCTOR INSULATION MUST BE CARRIED RIGHT UP TO THE TERMINAL CLAMP.
6. ALL STRANDS OF THE CONDUCTOR MUST ENTER THE TERMINAL CLAMP.
7. IF IT PROVES NECESSARY TO CROSS CONNECT TERMINALS THE CREEPAGE DISTANCE MUST BE MAINTAINED BY FITTING THE APPROPRIATE PARTITION/BARRIER.
8. USED AND UNUSED TERMINAL CLAMPS MUST BE TIGHTENED DOWN.
9. AVOID BUNCHING THE CONDUCTORS AS MUCH AS POSSIBLE TO PREVENT "HOT SPOTS" FORMING.
10. ENSURE THAT CIRCUITS ARE PROTECTED WITH AN OVERCURRENT DEVICE, WHICH WILL OPERATE WITHIN 4 HOURS AT 1.5 TIMES THE LOAD CURRENT. (BS88 : PT 2 FUSE FOR INSTANCE).
11. CABLES SHOULD BE TOUGH ENOUGH TO WITHSTAND MECHANICAL DAMAGE AND BE TERMINATED SO AS TO MAINTAIN THE INGRESS PROTECTION LEVEL OF THE ENCLOSURE THIS USUALLY MEANS SELECTING EITHER ARMoured OR METAL BRAIDED CABLES AND TERMINATION REQUIRES SPECIAL PURPOSE GLANDS.
12. CABLE ENTRY DEVICES MUST MAINTAIN THE SPECIFIED INGRESS PROTECTION LEVEL FOR THE ENCLOSURE (WHICH MAY REQUIRE THE USE OF SEALING WASHERS AND SEALING COMPOUND) AND BE CAPABLE OF WITHSTANDING SPECIFIED IMPACT TEST LEVELS. OBTAIN THE COMPONENT CERTIFICATE FOR THE CABLE ENTRY DEVICES BEING USED AND NOTE ANY SPECIAL LIMITATIONS WHICH MAY APPLY.
13. EARTHING FACILITIES ARE PROVIDED INSIDE THE ENCLOSURE AND AN EXTERNAL CONNECTION FACILITY IS PROVIDED FOR AN EARTHING OR EQUIPOTENTIAL BONDING CONDUCTOR. THE CONDUCTOR CROSS-SECTIONAL AREA SHOULD COMPLY WITH THE FOLLOWING TABLE:

| CROSS-SECTIONAL AREA OF PHASE CONDUCTORS OF THE INSTALLATION | MINIMUM CROSS-SECTIONAL AREA OF CORRESPONDING PROTECTIVE CONDUCTOR |
|--|--|
| S (mm <sup>2</sup> )   | S (mm <sup>2</sup> )   |
| S ≤ 16   | S  |
| 16 < S ≤ 35  | 16   |
| S ≥ 35   | 0.5 S  |

EARTHING AND EQUIPOTENTIAL BONDING CAN BE COMPLEX REQUIRING CROSS-REFERENCE TO NUMEROUS TECHNICAL DOCUMENTS DEPENDING ON THE APPROPRIATE NATIONAL WIRING REGULATIONS AND INSTALLATION RULES AND THESE DOCUMENTS SHOULD BE STUDIED.

14. DO NOT OPEN WHEN ENERGIZED.
15. MAX V & MAX I DEPENDING ON INSTALLATION, MARKED ON LABEL

## MAINTENANCE

ELECTRICAL APPARATUS INSTALLED IN HAZARDOUS LOCATIONS HAS DESIGN FEATURES THAT MAKE IT OPERATIONALLY SAFE UNDER NORMAL CONDITIONS. IN ORDER TO ENSURE THAT THE APPARATUS REMAINS SERVICEABLE THE FOLLOWING POINTS SHOULD BE ATTENDED TO ON A PERIODICAL BASIS.

1. THE ENCLOSURES ARE GENERALLY FREE FROM CORROSION PROBLEMS BEING CARBON LOADED GLASS RE-INFORCED POLYESTER WHICH IS RESISTANT TO PETROCHEMICAL PRODUCTS SUCH AS PETROL, BENZOL, AND DIESEL OIL, ETC. WHERE POSSIBLE CHEMICAL ATTACK IS EVIDENT CHECKS FOR CORROSION SHOULD BE ADHERED TO. THE ENCLOSURES HAVE GOOD CHEMICAL RESISTANCE (HYDROCHLORIC ACID UP TO 30%, SULPHURIC ACID UP TO 10%, ACETONE, AMMONIA, PHOSPHOR ACID,

SOFTENERS, LUBRICANTS ETC.). CABLES AND ENTRY DEVICES SHOULD ALSO BE INVESTIGATED FOR POSSIBLE SIGNS OF DETERIORATION.

2. LOOSE TERMINAL WIRING INCLUDING EARTH BONDING CONNECTIONS.

3. CONDITION OF ENCLOSURE COVER GASKET WHICH IS IN AN 'O' RING FORM (SILICONE).

4. LOOK FOR UNAUTHORISED MODIFICATIONS NOT COVERED BY ORIGINAL INSTALLATION DOCUMENTATION.

5. TERMINALS SHOW NO SIGNS OF DISTRESS OR BREAKAGE.

A CHECKLIST COVERING OTHER ESSENTIAL EXPLOSION PROTECTED CRITERIA WOULD BE USEFUL AND A LIST IS INCLUDED BELOW:

A). CORRECT CONDUCTOR SIZE FOR RATING HAS BEEN USED.

B). ONLY ONE WIRE PER TERMINAL CLAMP HAS BEEN INSTALLED.

C). ALL UNUSED TERMINAL SCREWS ARE TIGHTENED DOWN.

D). CREEPAGE AND CLEARANCE DISTANCES HAVE BEEN MAINTAINED.

E). VOLTAGE AND CURRENT RATINGS FOR TERMINALS AND CONNECTED CONDUCTORS ARE WITHIN CERTIFIED PARAMETERS.

F). POWER DISSIPATION DOES NOT EXCEED THE SPECIFIED LIMIT.

G). CONDUCTORS ARE NOT BUNCHED SO AS TO CREATE HOT SPOTS.

H). UNUSED CONDUCTORS ARE TERMINATED CORRECTLY NOT LEFT FLOATING WITHIN THE ENCLOSURE.