

BARTEC

GENERAL PANEL BUILDING SPECIFICATIONS

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1.0 INTRODUCTION

The purpose of this general document is to inform you concerning the panel development, way of mounting, wiring and the test according to the applicable standards.

2.0 GENERAL

This general specification document with belonging and applicable standards and directives is a supplement additional to the expertise we have in our workshop concerning building explosion proof panels-, control stations and terminal boxes.

The panels in our workshop will be manufactured according to the available wiring and lay-out drawings as well as the mutual agreement of both parties which is also stated in our offer / order confirmation.

3.0 GROUPING ON THE MOUNTINGPLATE

The components on the mounting plate will standard be mounted (in case possible) from top to bottom respectively:

- Fuses and / or circuit breakers
- Contactors and / or auxiliary relays, logical arranged to own view
- Heavy components like transformers, power supply etc.
- From left to right power terminals, main circuit terminal, control circuit terminals and other kind of terminals
- First claim is for the Ex i components, terminals (with the restriction of 50 mm or separation plate also for the wiring) to be mounted at the bottom right side
- The earth bar
- Preferential from left to right at the bottom side of the enclosure the glands
- Glands to be used for intrinsically safe signals preferable as far as possible at the right side

Before mounting the components, each of them is inspected on damages and correct voltages, current and power ratings. Using cable tray for internal wiring where possible (for Ex i signals blue cable tray will be used).

We prefer to keep as much space as possible for the customer to connect the incoming signals, in case of using stopping plugs we try to keep free space within this area for future expansion.

4.0 LAY-OUT COVER

When not specified by the customer, BARTEC will assemble the enclosures with the hinges at the left-, or bottom side and the components in the cover will be standard mounted from top to bottom:

- The warning lamps;
- The "running" lamps
- The "in" pushbuttons / switches
- The "out" pushbuttons / switches

The wiring to the mounting plate which also includes a green/yellow earthing wire of a sufficient diameter for earthing the lid, need to be surrounded by a flexible hose or "SPIRAP" band, and need the use of cable tray if possible.

5.0 PUSHBUTTONS

Pushbuttons are to be provided in according to the colour code as per below table in case not specified in the customers specifications / wiring diagram.

Colour	Meaning	Explanation	Examples
Red	Emergency	Actuate in case of danger or emergency	EMS Start of an emergency function
Yellow	Abnormal	Actuate in abnormal situation	Action need to be taken to escape abnormal situation Intervention to start interrupted automatic process again
Green	Normal	Actuate in safe situation or to realise a normal situation	See note below
Blue	Mandatory	Actuate in situation where action need to be	Function reset
White	Without specific meaning	General to start up functions, except EMS (see note)	"start"/"on"(preferred) "stop"/"of"
Grey			"start"/"on" "stop"/"of"
Black			"start"/"on" "stop"/"of" (preferred)
Note In case an additional code is used (i.e. surface structure, form or location) for indication of the pushbuttons for actuating, the same colour WHITE, GREY or BLACK can be used for several functions like i.e. White for "start"/"on"- and "stop"/"of" pushbuttons.			

The colour of the "start/on"-knobs need to be white, grey or black, preferable white. Green, yellow and red shall not be used.

6.0 INDICATION LIGHTS

Indication lights and their meanings with respect to the condition of the machine as per below table in case not specified in the customers specifications / wiring diagram.

Colour	Meaning	Explanation	Action by operator
RED	Emergency	Hazardous condition	Immediate action to deal with hazardous condition (for example switching off the machine supply, being alert to the hazardous condition and staying clear of the machine)
YELLOW	Abnormal	Abnormal condition Impending critical condition	Monitoring and-or intervention (for example by re/establishing the intended function)
BLUE	Mandatory	Indication of a condition that requires action by the operator	Mandatory action
GREEN	Normal	Normal condition	Optional
WHITE	Neutral	Other conditions+ may be used whenever doubt exists about the application of RED, YELLOW, GREEN, BLUE	Monitoring

7.0 IDENTIFICATIONS OF THE SWITCHGEAR AND ITS COMPONENTS

Every switchgear (panel/junction box) is provided at the outside of the enclosure with a BARTEC nameplate mentioning the belonging unique order number and in case necessary a serial number (only when having more identical products under one position).

All tagplates / nameplates (Gravoplay) on the enclosures are durable fixed using glue. The components internally are to be provided with the indication numbers as per wiring diagram or lay-out drawing, in case the components are marked on the component themselves BARTEC uses white polyester labels 12,7 x 6,99 mm, in case the marking is next to the component, white polyester Resopal lookalike labels are used.

Internally each component will be tagged conform the coding in the wiring diagram.

8.0 WIRING

The diameter (mm²) and colour code according to below table, when the wiring code and colour is different it needs to be confirmed by BARTEC in the general text of the offer or order confirmation. The standard wiring used is flame-retardant type H05V-2K or H07V-2K.

Colour coding: Main current AC/DC	Phase Zero Earth	Black Light blue Yellow/green
Control voltage AC	Phase Switch wire Zero Earth	Red Red Red/white Yellow/green
Control voltage DC	Phase (L) Switch wire Zero (N) Earth	Dark blue Dark blue Dark blue/white Yellow/green
Earth, isolated from PE	Instrument earth (IE) Intrinsically safe earth (ISE)	Black/yellow
Measurement		Grey
Supply from other source (potential free contacts)		Orange
Ex i		Light blue ac. IEC-60079-14

Nominal current [A]	Cross-section [mm ²]	Ferrules colour	Cross-section of PE	
			S line	S PE
6	1	red		
16	1,5	black	S ≤ 16	S
25	2,5	blue	16 ≤ S ≤ 35	16
35	4	grey	35 ≤ S ≤ 400	S/2
40	6	yellow		
63	10	red		
80	16	blue		
100	25	yellow		
125	35	red		
160	50	blue		
200	70	yellow		
250	95	red		
315	150	yellow		
400	185			
500	300			
500/600	400			

All internal wiring ends shall be crimped with (twin) wire end ferrules with plastic collars and / or compression type of connector pins or lugs. The internal wiring is standard marked with "PARTEX" numbering unless otherwise stated in the offer / order confirmation.

8.1 MARKING OF WIRING

Wires to be equipped with PARTEX wire numbers conform terminal numbers.

Alternatives would be possible: e.g. no wire numbers indicated (less price) or the use of sleeves (plus price).

9.0 TERMINALS

The panels/switchgears, junction boxes standard provided with Weidmüller / Phoenix or Wago terminals.

Terminals for intrinsically safe signals shall have the colour blue, terminals for non-intrinsically safe signals with exception of earth terminals shall have the colour beige.

Terminal row located at a approachable location where all necessary connections properly can be realised. In case needed the terminal row is to be angle mounted on STW brackets to realise more space / better access.

Terminals shall have identification numbers (black text on white background) on both sides of the terminal (in case stock-terminals are used also top and bottom side to be numbered). Terminal row to be numbered (X1 etc.) if known.

Separation plate shall be placed between the terminals of different outgoing power circuits and power & control terminals. Blue Ex i terminals need to be separated by a separation plate or at least 50 mm distance to another terminal.

10.0 PAINTING

Standard coating Ex d boxes

Type of coating	:	powder coating
Colour	:	standard grey RAL 9006 other colours on request
Application	:	electrostatic spraying
Drying type	:	in oven 160-190°C
Thickness	:	minimum 80-200 µm

11.0 FREE ISSUED EQUIPMENT

Free issued material by the client need to be at least 3 weeks (or different if otherwise agreed upon) before planned delivery in our warehouse to keep planned delivery time in case not specifically defined.

All free issued material need to be supplied complete with the necessary mounting equipment (i.e. special mounting rail, terminals, special type of cable etc, 3G marking and EC declaration)

BARTEC will not program, programmable controllers if they are part of the free issued equipment unless otherwise agreed upon.

12.0 ELECTRICAL PARAMETERS

To properly proceeding in case of order without any delay we need the correct connection details for the marking of the certification label.

Missing this crucial information can delay the delivery of the order, therefore we kindly ask you to return the information to our project leader if this information is missing.

13.0 SHOCK-HAZARD PROTECTION

All power conductors which unintentional can be touched are to be provided by a certain obstacle (i.e. a synthetic plate) which can only be removed by using a tool. The synthetic protection plate to be provided with a marking sign high voltage.

14.0 PANEL EARTHING

All earth connections of the component/cover/enclosure need to be connected according to the star principle. The star point can be the earth bar and/or earth terminals on DIN rail. The earth bar- or terminals need to be approachable for easy cable connecting.

15.0 EXTERNAL EARTHING

An external earth connection facility needs to be available at any metal enclosure.

16.0 EARTHING THE COVER

Cover earthing isn't depending on any mechanical mounting, hinges or mounting rail, which implicates that the cover always need to be earthed with a yellow/green earthing core of the same diameter as the biggest voltage carrier but minimum of 2,5 mm².

17.0 CONTROL VOLTAGE

The nominal voltage of a transformer for a control circuit may not exceed 250 V.

18.0 PROTECTION OF CONTROL VOLTAGE

Control circuits need to be provided with fuses resp. circuit breaker or any other form of short circuit protection. Control circuits which are powered by a transformer need to be dual fused or the zero /- needs to be connected to earth.

19.0 TESTING

Every panel/switchgear will be tested before shipment according to the by the customer supplied or approved wiring diagram. This implicates no functional test with power load in case not explicitly requested and agreed upon with BARTEC.

After above mentioned connection the panels are tested according to the valid standard EN-60204-1:2006.

20.0 DOCUMENTS

As-built drawings will be added with the supply of the panel/switchgear/control station in case part of supply. In case of wiring diagram provided by the client the As built information will be marked up manually on the drawings.

Fixed mounted on each panel/switchgear/control station the necessary EC declaration of conformity and instruction manual plus additional the certificate.

21.0 DEVIATION ATTACHMENT A

We understand that it's possible that you as customer have a different request as per the BARTEC standard. For this reason we have an additional attachment which enables you to vary in this and gives us the possibility to properly revise the offer and assemble the panels as per your specific demands.

ATTACHMENT A

Optional deviations from BARTEC standard (standard marked bolt with underscore)

Wires **standard H05V-2K/H07V-2K** / Halogen free H05Z-K or H07Z-K

Wire trunks **PVC (flame retardant)** / Halogen free

Wire marking No marking / **Partex** / Sleeves

Wire colour define requested colour in case BARTEC standard is different

Hinges side **left** / right / top / bottom

Tagplates **glued** / screwed

Gravoplay (White with black text) / AISI316