SIMATIC

Distributed I/O
Distributed I/O device
6DL2804-1xxxx & 6DL2804-2xxxx

Hardware Installation Manual
Legal information

Warning notice system
This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

![Danger Symbol]

**DANGER**  
indicates that death or severe personal injury will result if proper precautions are not taken.

![Warning Symbol]

**WARNING**  
indicates that death or severe personal injury may result if proper precautions are not taken.

![Caution Symbol]

**CAUTION**  
indicates that minor personal injury can result if proper precautions are not taken.

![Notice Symbol]

**NOTICE**  
indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel
The product/system described in this documentation may be operated only by personnel qualified for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products
Note the following:

![Warning Symbol]

**WARNING**  
Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks
All names identified by ® are registered trademarks of Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of Liability
We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.
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Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines, and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens’ products and solutions only form one element of such a concept. Customer is responsible to prevent unauthorized access to its plants, systems, machines and networks. Systems, machines and components should only be connected to the enterprise network or the internet if and to the extent necessary and with appropriate security measures (e.g. use of firewalls and network segmentation) in place.

Additionally, Siemens’ guidance on appropriate security measures should be taken into account. For more information about industrial security, please visit: http://www.siemens.com/industrialsecurity.

Siemens’ products and solutions undergo continuous development to make them more secure. Siemens strongly recommends to apply product updates as soon as available and to always use the latest product versions. Use of product versions that are no longer supported, and failure to apply latest updates may increase customer’s exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed under

2.1 General information

This device left the factory in a perfect state with regard to safety. To maintain this status and to ensure safe operation of the device, note and follow the instructions and warnings in this manual.

2.2 Laws and directives

Observe the provisions of the test certification valid for your country.

Electrical connection in potentially explosive atmospheres

When making electrical connections, observe the national regulations and laws for hazardous areas valid for your country. In Germany, for example, the following apply:

- Ordinance on Industrial Safety and Health
- Standard relating to the installation of electrical systems in hazardous areas DIN EN 60079-14 (previously VDE 0165, T1)

2.3 Qualified personnel

Qualified personnel are people who are familiar with the installation, mounting, commissioning, and operation of the product. These people have the following qualifications:

- They are authorized, trained or instructed in operating and maintaining devices and systems according to the safety regulations for electrical circuits, high pressures and aggressive as well as dangerous media.
- For devices intended for use in explosive atmospheres: They are authorized, trained, or instructed in working on electrical circuits for systems in potentially explosive atmospheres.
- They are trained or instructed in maintenance and use of appropriate safety equipment according to the safety regulations.
- They should be trained in first aid.
2.4 Measures

In the interest of safety, observe the following precautionary measures:

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of protection &quot;Flameproof enclosure d&quot;</strong></td>
</tr>
<tr>
<td>Devices with &quot;pressure-resistant encapsulation&quot; protection may only be opened when the power has been disconnected.</td>
</tr>
<tr>
<td><strong>Type of protection &quot;Intrinsic safety i&quot;</strong></td>
</tr>
<tr>
<td>&quot;Intrinsically-safe&quot; devices lose their certification as soon as they are operated on circuits which do not correspond with the test certification valid in your country.</td>
</tr>
<tr>
<td><strong>Type of protection &quot;Increased safety e&quot;</strong></td>
</tr>
<tr>
<td>Devices with the type of protection &quot;Increased safety&quot; must not produce sparks or electric arcs during operation under normal conditions. Electrical equipment and parts must not exceed a rated voltage of 11 kV.</td>
</tr>
<tr>
<td><strong>Type of protection &quot;Mold encapsulation m&quot;</strong></td>
</tr>
<tr>
<td>Devices with the type of protection &quot;Mold encapsulation&quot; are potted in casting compound.</td>
</tr>
<tr>
<td><strong>Type of protection &quot;By means of enclosure t&quot;</strong></td>
</tr>
<tr>
<td>Devices with the type of protection &quot;By means of enclosure&quot; prevent the penetration of dust or reduce it to a harmless level. Explosive equipment can be installed. The temperature on the housing must not ignite the surrounding atmosphere.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Use in environments with aggressive and dangerous media</strong></td>
</tr>
<tr>
<td>The device can be operated both at high pressure and with aggressive and hazardous media. Therefore, improper use of this device may lead to serious injury and or considerable damage to property. Above all, it must be noted when the device was in use and is to be exchanged.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electrostatic sensitive devices</strong></td>
</tr>
<tr>
<td>This device contains electrostatic sensitive devices. ESD devices can be destroyed by voltages well below the threshold of human perception. These static voltages develop when you touch a component or electrical connection of a device without having discharged the static charges present on your body. The damage to a module as a result of overvoltage cannot usually be detected immediately. It may only become apparent after a long period of operation.</td>
</tr>
</tbody>
</table>
Purpose of this documentation

This manual contains all the information that you will require to install and use the device. It is intended for persons who install the device mechanically, connect it electrically, set parameters and commission it, as well as for service and maintenance technicians.
Purpose of this documentation
4.1 Overview

The device is used as a control, switching and distribution unit in hazardous areas (gas: Zones 1, 2; dust: 21, 22; mining: M2). The product satisfies the requirements of the following standards:

- EN/IEC 60079-0 General requirements
- EN/IEC 60079-7 Enhanced safety
- EN/IEC 60079-31 Protection by means of enclosure

The device consists of the wall-mounted enclosure and the components installed in it, for each of which there are separate certificates.

The device is also identified by the standards of the installed components. The supplied ATEX certificate applies to the device and to the components installed by the manufacturer.

4.2 Area of application

- The wall-mounted enclosures are suitable for installation and operation of distributed I/O, such as ET 200iSP, in the following hazardous areas:
  - Device group I (mining, M2)
  - Device group II (Zones 1 + 2 gas, and Zones 21 + 22 dust)
- The device consists of the wall-mounted enclosure (6DL2804-0xxxx) and the installed electronic components.
- The device has been tested and certified for use in these hazardous areas.

Note

Product information on the Internet

You will find further information on installing and connecting the electronic components, for example in:

- ET 200iSP manual (A5E00247482)
- Principles of explosion protection manual (6ES7398-8RA00-8BA0)

This information is available on the Internet on the Siemens home page.

- Only open the enclosure in Zones 21 and 22 if no ignitable dust atmosphere is present.
- The device is identified depending on:
  - The installed components
  - Use for the following hazardous areas: gas, dust or mining
4.3 **Product features**

The device consists of a separately certified wall-mounted enclosure (6DL2804-0xxxx). The enclosure is made of stainless steel and is intended for wall mounting. The device is intended for the installation of control and measuring devices such as:

- Distributed I/O systems:
  - ET 200iSP for use in Zones 1 and 2 (gas), Zones 21 and 22 (dust), and M2 (mining)
- Modular electro-pneumatic automation system AirLine Ex (type 8650, from the company Bürkert)
- Buffer stages and safety barriers
- Relays, buffer elements and fuses
- Separate terminals for intrinsically safe and non-intrinsically safe circuits
- Command and signaling devices
- Temperature sensors
- Heating and thermostat
- Lightning protection components
- FO coupler

4.4 **Structure of the type designation**

The device has type designation:

```
6DL2804 - xxxxx
```

- 0 permissible operating temperature from -20 °C plastic terminal, black
- 1 permissible operating temperature from -40 °C metal terminal
- 2 permissible operating temperature from -20 °C plastic terminal, blue
- 6 permissible operating temperature from -20 °C metal terminal, for mining
- 1 with 1 row of terminals
- 2 with 2 rows of terminals
- 3 with 3 rows M16 terminals
- 4 with 3 rows M20 terminals
- 5 with 5 rows M16 terminals
- 6 with 5 rows M20 terminals
- D Dimensions 650 x 450 x 230 mm (W x H x D)
- E Dimensions 950 x 450 x 230 mm (W x H x D)
- F Dimensions 650 x 450 x 350 mm (W x H x D)
- G Dimensions 950 x 450 x 350 mm (W x H x D)
- H...W Dimensions max. 1 000 x 1 200 x 300 mm (W x H x D)
- A Zone 1 + 2
- D Zone 21 + 22
- M Mining M2
- 1 Installation of components without electro-pneumatic system
- 2 Installation of components with an electro-pneumatic system (Bürkert)
The enclosure sizes D...G have a cover which pivots upwards by means of gas-filled dampers. The enclosure sizes H...W have doors with right-hand hinges (close on left).
4.5 Design of enclosure

Standard enclosure 6DL2804-0xD...Gxx

Figure 4-1 Standard enclosure 6DL2804-0xD...Gxx

W x H x D: See Structure of the type designation (Page 12)
4.5 Design of enclosure

Standard enclosure 6DL2804-0xH...Wxx

Figure 4-2 Standard enclosure 6DL2804-0xH...Wxx, view 1
Description

4.5 Design of enclosure

![Diagram of enclosure with numbered parts]

1. Mounting plate
2. Drainage/pressure compensation nozzle
3. Equipotential bonding rail with terminals
4. M16 or M20 cable glands (*)
5. M20 cable glands (*)
6. M32 cable glands (*)
7. M6 grounding screw
8. Removable connection to enclosure ground
9. Optional power supply terminals

*) The size and number of cable glands can be defined specific to the project.

Figure 4-3 Standard enclosure 6DL2804-0xH…Wxx, view 2
4.6 Details of the enclosure

Degree of protection

The degree of protection depends on the enclosure size and the parts used such as cable entries, dummy plugs and climate nozzles. The nameplate specifies the degree of protection for which the enclosure is designed. The minimum degrees of protection are:

- Device group I: IP54/IP55
- Device group II: IP54 to IP66 (Zones 1 + 2)
- Device group II: IP64 to IP66 (Zones 21 + 22)

Operating temperature

The operating temperature range of the enclosure depends on the temperature range of the parts used, and can differ from the actual operating temperature range:

- -40 °C to +75 °C: only for the enclosure versions 6DL2804-0xxx1
- 0 °C to +75 °C

The nameplate specifies the permissible operating temperature range in each case.

Prior to installation of components, check the operating temperature range of the complete setup. The operating temperature range for the complete setup may be limited by the maximum permissible operating temperature of the components and the dissipated heat produced in the enclosure.

Climate nozzles provide pressure compensation and drainage in the event of varying climatic conditions.

In the case of aggressive environments, check whether use of the enclosure is possible with the material in question. Delivery of enclosures with appropriate surface protection is possible for use with aggressive environmental conditions.

Cable and wiring entries (CWE)

- When fitting cables, observe the manufacturer's data on the tightening torques of the cable and wiring entries.
- Use the tightening torque of the clamping screw when connecting the cables.
- Relieve the tension on the cables outside the enclosure so that the cable gland is not stressed.
- For additional information and technical specifications, refer the respective manufacturer documentation, in particular:
  - Technical specifications, clamping ranges for cables
  - Notes on use, installation, mounting, commissioning and maintenance
**Note**
Use the supplied red dummy plugs to close any cable glands not in use. Only then is it ensured that the degree of protection is retained.

**Equipotential bonding rail**

The equipotential bonding rail (10 x 3 mm) with terminals (up to 4 mm²) is used to contact the cable shields. Alternatively, you can also use other terminals here, e.g. KLBüCo from the company Weidmüller (not included in the scope of delivery).

Connect the equipotential bonding wire to the bonding terminal (0.75 to 35 mm²).

Short lines connect the equipotential bonding rail to the mounting plate and thus to the enclosure.

**Note**
Also observe the installation guidelines in the ET200iSP operating instructions, Section 5.2 "Using ET 200iSP with equipotential bonding".

**Wall supports**

Screw the wall supports onto the enclosures using M6/M8 screws depending on the enclosure size. These are included with the enclosure accessories. To secure the enclosure, use 8 mm diameter screws and lock washers.

**Grounding connection**

The M6/M8 ground connection screw is used for the PE conductor; use a cable with lug for this. To prevent the screw from becoming loose, make sure you use the lock washer.

Connecting the grounding cable avoids static charge which is important, in particular, for dust explosion protection.

**Installed components**

The enclosure nameplate specifies the parameters within which the installed components can be used.

Observe the following if you subsequently connect equipment and the required cables on site:

- Read and observe the manufacturer's instructions, especially notes, warnings and information on special features.
- Electrical equipment as well as combinations of equipment can impair the intrinsic safety of the circuits as a result of their electrical parameters. Prior to installing equipment, check that the intrinsic safety of the circuit is still guaranteed.
Mounting

5

Note

- When installing control and measuring devices in the Ex enclosure, keep to the instructions in the relevant product descriptions and the technical specifications in the data sheets.
- All control and measuring devices installed in the enclosure must be separately certified for the relevant hazardous zone.
- Run the tests prescribed in the relevant national regulations for the installed control and measuring devices.

Note

- Install and operate the distributed I/O device in hazardous areas according to the specifications of the EC-type examination certificate according to ATEX and these operating instructions or the standards and directives valid in your country.
- Assembly, installation, commissioning and maintenance may only be performed by qualified personnel.
- The devices and installed components must only be used for their intended purpose.

5.1 Transport and storage

Pack and store the enclosure for transport or storage so that there can be no undue strain on the enclosure, particularly on its top cover. If there is too much strain on the top cover of the enclosure, this can damage the seal.

Do not place the enclosure on the cable glands fitted in its base, otherwise the glands will be damaged.
5.2 Mounting the enclosure

The enclosure is intended for wall mounting and should be secured with the wall supports supplied with it. Use the following template for the drilling.

![Drilling template for securing the device]

Figure 5-1 Drilling template for securing the device

**CAUTION**

**Danger of injury when the enclosure is opened**

When opening the enclosure with pivoting cover, the cover is pressed upwards by means of the pressure of the dampers. When opening, press against the cover with your hand.

**Note**

- Remember the maximum thermal load on the cables and wiring. The degree of protection is only ensured when suitable cables and wires are used and correctly installed.
- Note that it is only permitted to connect and disconnect the cables to the power supply module if the module has been powered down.
- The degree of protection is reduced when the enclosure is mounted vertically.

**Procedure**

1. To open the enclosure, unlock using a double-bit key (included with the enclosure). Hold the cover firmly while unlocking to make sure that it does not spring up as a result of the pressure of the dampers.
2. Mount the wall support (included in the enclosure accessories) to the rear panel of the enclosure in accordance with Fig. 4-1. Secure the enclosure using 8 mm diameter screws and lock washers at the location of use.
3. Install and secure the cables entering the enclosure and make sure they have adequate strain relief. The cable entry may only be used for strain relief if suitable cable glands are used.

4. Route the cables from below through the associated glands and tighten the clamping screw of the gland at the torque specified in the manufacturer’s instructions.

5. Make a short connection between the cable screen and the equipotential bonding rail.

6. Route and connect in accordance with EN 60079-11:
   - The power supply cable
   - The bus cable
   - The signal cables

In hazardous areas, the installation regulations according to EN 60079-14 and the national regulations must also be observed.

7. If you replace installed components, follow the instructions in the manufacturer’s description of the device.

See also

Design of enclosure (Page 14)
5.3 Installing the enclosure outdoors

The enclosure should have at least IP56 protection when installing outdoors. This prevents damaging amounts of dirt or water from penetrating the enclosure under normal ambient conditions. Take the following additional protective measures depending on the environment of the installation location:

- Avoid subjecting the enclosure permanently to water (for example, snow).
- Remember that direct sunlight can cause excessive temperatures in the interior of the enclosure. In locations where this can occur, provide additional protection with some form of roofing.
- Note that opening the enclosure at ambient temperatures below 0 °C can damage the seal as a result of freezing.
- Condensation may be produced within the enclosure due to temperature variations. Climate nozzles are therefore installed to permit drainage and pressure compensation. Ensure when mounting the enclosure that the climate nozzles are at the lowest position.
- If you want to use the device in an aggressive environment, check whether this is possible with the material in question.

5.4 Optional installation components

The following separately certified components can be installed optionally:

- Terminals:
  - Ex e for the connection of cable cross-sections >4 mm,
  - Ex i for wiring of intrinsically safe signals (blue); these may only be used for Ex i signals.

  Make sure when arranging intrinsically safe and non-intrinsically safe terminals that they are separated (“thread measure”) by at least 50 mm.

- Temperature sensors:
  For monitoring the temperature inside the enclosure,

- Relays, disconnectors and fuses:
  For interrupting, switching or protecting individual signal circuits.

- Command and signaling devices:
  For manual switching (control switch) or optical display (indicator lamps) in the enclosure wall.

- FO couplers:
  For connecting the PROFIBUS of the ET 200iSP by means of FO cable

- Lightning protection components:
  For protecting the ET 200iSP components from lighting strikes when the enclosure is installed in exposed locations.
• Heater:
To prevent condensation in the enclosure at low temperatures, it is recommendable to install a heater. The heater must be dimensioned in accordance with the enclosure size. A heater permits operation of the devices at temperatures below -20 °C.

**Note**
If components with a supply voltage of 120 / 230 V AC are installed, you must fuse these devices according to DIN 41571 and/or IEC 60127 or in accordance with the manufacturer’s data.

• Modular electro-pneumatic automation system AirLine Ex (type 8650, from the company Bürkert):
Connected to the ET 200iSP components to form an automation system for processing electrical and pneumatic variables.
When connecting and operating, observe the manufacturer's descriptions and manuals.

• When installing a pneumatic system, exit the air passing through the exhaust connections out of the enclosure.

**NOTICE**
**Damage to seal or screwed glands**
Make sure that the vent of the pneumatic system does not blow directly into the enclosure. The pressure resulting in the enclosure would otherwise damage the seal and screwed glands, and the degree of protection would no longer be provided.

### 5.5 Use of I/O device at temperatures down to -40 °C

You must install a heater in the enclosure in order to operate the devices at temperatures down to -40 °C. Note the following:
When using a closed enclosure, only switch the installed components on following a specific warming-up time which depends on the enclosure size and heating power:

- With enclosure types 6DL2804-xxDxx and -xxExx, the warming-up time is at least 2 hours.
- With enclosure types 6DL2804-xxKxx and -xxUxx, the warming-up time is at least 3 hours.

![Temperature response graph](image)

**Figure 5-2** Temperature response with 100 W heater for 6DL2804-xxDxx / -xxExx

Temperature response inside the enclosure following switching-on of the heater at an outdoor temperature of -40 °C.

After > 2 hours, the internal temperature is above the minimum permissible operating temperature of -20 °C.
Temperature response inside the enclosure following switching-on of the heater at an outdoor temperature of -40 °C.
After > 3 hours, the internal temperature is above the minimum permissible operating temperature of the installed components of -20 °C.
5.5 Use of I/O device at temperatures down to -40 °C
Maintenance and servicing

- Select maintenance cycles so that problems can be recognized in good time. Check the following:
  - The device for visible damage
  - That the permitted temperatures are not exceeded
  - That the cables are securely connected,
  - Damage to cable and wiring entries
  - Enclosure gaskets for cracks and damage
  - Bonding of seal on the enclosure cover and at the bonding positions
  - Surface of seal for damage

- If the seal is damaged, replace the complete cover if necessary.

- If there is damage to the enclosure, there is a risk that the degree of protection is no longer valid. In some cases, this might necessitate replacement of the enclosure.

- If there is damage to cable and wiring entries, only replacement with original parts is permitted.

- Check regularly, once a year, that the cable and line entries are securely in place and properly sealed. Check the tightening torques. If necessary, re-tighten the glands to the torques specified by the manufacturer. For information on the torques, refer to the respective manufacturer documentation.
Table 7-1 Technical specifications 6DL2804-xxDxx / xxExx / xxFxx / xxGxx (not for mining)

<table>
<thead>
<tr>
<th>6DL2804-</th>
<th>xxDxx</th>
<th>xxExx</th>
<th>xxFxx</th>
<th>xxGxx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wall-mounted enclosure</td>
<td>Type 6DL2804-0xxxx, DMT 02 ATEX E 249 U</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ex marking</td>
<td>see below - section Ex marking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Degree of protection 1)</td>
<td>IP54 to IP66</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions: W x H x D</td>
<td>650 x 450 x 230</td>
<td>950 x 450 x 230</td>
<td>650 x 450 x 350</td>
<td>950 x 450 x 350</td>
</tr>
<tr>
<td>Material</td>
<td>Stainless steel: DIN 1.4404, plate thickness 1.5 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight [kg]</td>
<td>30</td>
<td>43</td>
<td>31</td>
<td>43</td>
</tr>
<tr>
<td>Cover seal</td>
<td>Silicone rubber</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cable entries for</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage (cable-Ø in mm)</td>
<td>2 M32 Ex e (13 to 21)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bus (cable-Ø in mm)</td>
<td>4 M20 Ex e (6 to 13)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Signals (cable-Ø in mm)</td>
<td>M16 (4 to 9)</td>
<td>M16 (4 to 9)</td>
<td>M20 (6 to 13)</td>
<td>M20 (6 to 13)</td>
</tr>
<tr>
<td>3 rows (xxx3x)</td>
<td>39</td>
<td>66</td>
<td>36</td>
<td>57</td>
</tr>
<tr>
<td>5 rows (xxx5x)</td>
<td>65</td>
<td>110</td>
<td>60</td>
<td>95</td>
</tr>
<tr>
<td>Equipotential bonding rail</td>
<td>3 x 10 mm Cu</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bonding terminals</td>
<td>0.75 to 35 mm² Ex e for equipotential bonding cable, 4 mm² for shield connection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protective conductor connector</td>
<td>M6 screw, at least 16 mm²</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated voltage/current 2)</td>
<td>These values depend on the installed components.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature range</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6DL2804-1xxxx with installation of ET200iSP</td>
<td>-20 °C to +xx °C 3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6DL2804-1xxx1 with installation and heater</td>
<td>-40 °C to +xx °C 3) 4)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6DL2804-2xxxx with installation of ET200iSP and electro-pneumatic system AirLine Ex Typ 8650</td>
<td>0 °C to +xx °C 3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permissible humidity</td>
<td>Max. 95%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1) The degree of protection of the enclosure depends on that of the installed parts and the enclosure size.
2) The actual electrical values depend on the electrical equipment installed. The manufacturer specifies the final values within the framework of these limits.
3) The specified permissible operating temperature range is only valid if the enclosure is installed horizontally. A vertical installation can reduce the maximum permissible temperature (for information on this refer also to the ET200iSP manual). The max. operating temperature is defined depending on the dissipated heat of the installed components, and specified on the nameplate. Note that the operating temperature of the complete setup must be checked again if further components are subsequently fitted.
4) The temperature range of -40 °C only applies to the enclosure types 6DL2804-1xxx1 (metal cable entries). Installation of a heater is required for this.
### Table 7-2  Technical specifications 6DL2804-xMDxx / xMExx (for mining)

<table>
<thead>
<tr>
<th>6DL2804-</th>
<th>xMDxx</th>
<th>xMExx</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wall-mounted enclosure</strong></td>
<td>Type 6DL2804-0xxxx, DMT 02 ATEX E 249 U</td>
<td></td>
</tr>
<tr>
<td><strong>Ex marking</strong></td>
<td>see below - section Ex marking</td>
<td></td>
</tr>
<tr>
<td><strong>Degree of protection</strong> ¹</td>
<td>IP54/IP55</td>
<td></td>
</tr>
<tr>
<td><strong>Dimensions: W x H x D</strong></td>
<td>650 x 450 x 230</td>
<td>950 x 450 x 230</td>
</tr>
<tr>
<td><strong>Material</strong></td>
<td>Stainless steel: DIN 1.4404, plate thickness 1.5 mm</td>
<td></td>
</tr>
<tr>
<td><strong>Weight [kg]</strong></td>
<td>35</td>
<td>39</td>
</tr>
<tr>
<td><strong>Cover seal</strong></td>
<td>Silicone rubber</td>
<td></td>
</tr>
<tr>
<td><strong>Cable entries for</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Voltage (cable-Ø in mm)</strong></td>
<td>6 M25 (Ex e)</td>
<td>(9 to 12 )</td>
</tr>
<tr>
<td><strong>Bus (cable-Ø in mm)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Signals (cable-Ø in mm)</strong></td>
<td>M32 (18 to 21)</td>
<td>M32 (18 to 21)</td>
</tr>
<tr>
<td>3 / 1 row (1Mxxx)</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>5 / 2 rows (1Mxxx)</td>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td><strong>Equipotential bonding rail</strong></td>
<td>3 x 10 mm Cu</td>
<td></td>
</tr>
<tr>
<td><strong>Bonding terminals</strong></td>
<td>0.75 to 35 mm² Ex e for equipotential bonding cable, 4 mm² for shield connection</td>
<td></td>
</tr>
<tr>
<td><strong>Protective conductor connector</strong></td>
<td>M6 screw, at least 16 mm²</td>
<td></td>
</tr>
<tr>
<td><strong>Rated voltage/current</strong> ²</td>
<td>These values depend on the installed components.</td>
<td></td>
</tr>
<tr>
<td><strong>Operating temperature range</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6DL2804-1xxxx with installation of ET200iSP</td>
<td>-20° C to +xx °C ³</td>
<td></td>
</tr>
<tr>
<td><strong>Permissible humidity</strong></td>
<td>Max. 95%</td>
<td></td>
</tr>
</tbody>
</table>

¹ The degree of protection of the enclosure depends on that of the installed parts and the enclosure size.

² The actual electrical values depend on the electrical equipment installed. The manufacturer specifies the final values within the framework of these limits.

³ The specified permissible operating temperature range is only valid if the enclosure is installed horizontally. A vertical installation can reduce the maximum permissible temperature (for information on this refer also to the ET200iSP manual). The max. operating temperature is defined depending on the dissipated heat of the installed components, and specified on the nameplate.

Note that the operating temperature of the complete setup must be checked again if further components are subsequently fitted.

### Table 7-3  Technical specifications 6DL2804-xxKxx / xxTxx / xxUxx

<table>
<thead>
<tr>
<th>6DL2804-</th>
<th>xxKxx</th>
<th>xxTxx</th>
<th>xxUxx</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wall-mounted enclosure</strong></td>
<td>Type 6DL2804-0xxxx, DMT 02 ATEX E 249 U</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ex marking</strong></td>
<td>see below - section Ex marking</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Degree of protection</strong> ¹</td>
<td>IP54 to IP66</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dimensions [mm]: W x H x D</strong></td>
<td>800 x 800 x 300</td>
<td>1 000 x 1 000 x 300</td>
<td>1 000 x 1 200 x 300</td>
</tr>
</tbody>
</table>
**Technical specifications**

<table>
<thead>
<tr>
<th>6DL2804-xxxx</th>
<th>xxKxx</th>
<th>xxTxx</th>
<th>xxUxx</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Material</strong></td>
<td>Stainless steel: DIN 1.4301, plate thickness: 1.5 mm with edge length up to 800 mm, 2.0 mm with edge length 1 000 mm or more</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Weight [kg]</strong></td>
<td>65</td>
<td>92</td>
<td>100</td>
</tr>
<tr>
<td><strong>Cover seal</strong></td>
<td>Silicone rubber</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cable entries</strong></td>
<td>Made of plastic or metal; size and number depending on requirements</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Equipotential bonding rail</strong></td>
<td>3 x 10 mm galvanized Cu with terminals 4 to 35 mm²</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Protective conductor connector</strong></td>
<td>M8 screw, at least 16 mm² with cable lug</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rated voltage/current</strong></td>
<td>Max. 1 000 V / 100 A</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Operating temperature range</strong></td>
<td>-20 °C to +xx °C or -40 °C to +xx °C or 0 °C to xx °C</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Permissible humidity</strong></td>
<td>Max. 95%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1) The degree of protection of the enclosure depends on that of the installed parts and the enclosure size.

2) The actual electrical values depend on the electrical equipment installed. The manufacturer specifies the final values within the framework of these limits.

3) The specified permissible operating temperature range is only valid if the enclosure is installed horizontally. A vertical installation can reduce the maximum permissible temperature (for information on this refer also to the ET200ISP manual). The max. operating temperature is defined depending on the dissipated heat of the installed components, and specified on the nameplate. Note that the operating temperature of the complete setup must be checked again if further components are subsequently fitted.

4) The temperature range of -40 °C only applies to the enclosure types 6DL2804-1xxx1 (metal cable entries). Installation of a heater is required for this.

**Ex marking**

- II 2 (1) G Ex e d ib [ia Ga] IIC T4 Gb (with heater T3) or
- II 2 (1) G Ex e d mb ib [ia Ga] [ia op is Ga] IIC T4 Gb (with heater T3) or
- II 2 (1) D Ex tb [ia IIIC Da] IIIC T130°C Db or
- II 2 (1) D Ex tb [ia IIIC Da] [Ex ia Da] IIIC T130°C Db
- I M2 Ex e d ib [ia Ga] I Mb or
- I M2 Ex e d mb ib [ia Ga] I Mb
Ground points in the enclosure

Figure 8-1  Fixed and detachable connections to ground and equipotential bonding rail

- Fixed galvanic electrical clamp or screw connection inside enclosure
- Power supply terminal module with componentry
- IM / EM terminal module with IM componentry (IM = interface module, EM = electronic module)
- EM / EM terminal module (EM = electronic module)
- Mounting plate
- Mounting rail
- Equipotential bonding rail with terminals
- Cable connection can be disconnected inside enclosure
- Connection from the equipotential bonding rail to the enclosure
- Cable for signal lines shield on equipotential bonding rail
- PROFIBUS cable to IM
- Bonding cable
- Power supply (line to power supply)
- M6 grounding connection external
Ground points in the enclosure
9.1 Installation: ET200iSP components

1. Power supply (PS) terminal module
2. IM/EM terminal module with IM component (IM = interface module, EM = electronic module)
3. EM/EM terminal module with I/O component (I/O = input/output)
4. Termination module
5. Mounting rail
6. Equipotential bonding rail with terminals
7. Cable entry for signal lines M16 (4 to 9 mm) or M20 (6 to 13 mm)
8. Cable and wiring entry for PROFIBUS M20
9. Screw gland for pressure/climate compensation
10. Cable and wiring entry for power supply M32 (13 to 21 mm)

Figure 9-1  Distributed I/O device 6DL2804-xxD...Gxx with installation of ET 200iSP
9.1 Installation: ET200iSP components

Figure 9-2  Distributed I/O device 6DL2804-xxH...Wxx with installation of ET200iSP
9.2 Installation: Heating

1. Heating
2. Thermostat
3. Infeed terminals

Figure 9-3 Distributed I/O device with installation of heating
9.3 Installation: FO conductor

Figure 9-4 Distributed I/O device with installation of FO coupler: single and redundant designs

1. FO coupler
2. Terminals for power supply and distribution 24 V DC
What does ESD mean?

All electronic modules are equipped with large-scale integrated ICs or components. Due to their design, these electronic elements are highly sensitive to overvoltage, and thus to any electrostatic discharge.

The electrostatic sensitive components/modules are commonly referred to as ESD devices. This is also the international abbreviation for such devices.

ESD modules are identified by the following symbol:

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESD devices can be destroyed by voltages well below the threshold of human perception. These static voltages develop when you touch a component or electrical connection of a device without having discharged the static charges present on your body. The electrostatic discharge current may lead to latent failure of a module, that is, this damage may not be significant immediately, but in operation may cause malfunction.</td>
</tr>
</tbody>
</table>

Electrostatic charging

Every person without a conductive connection to the electrical potential of his/her surroundings can be electrostatically charged.

The figure below shows the maximum electrostatic charge that can build up on a person coming into contact with the materials indicated. These values correspond to IEC 801-2 specifications.
Basic protective measures against electrostatic discharge

- Ensure good equipotential bonding:
  When handling electrostatic sensitive devices, ensure that your body, the workplace and packaging are grounded. This prevents electrostatic charge.

- Avoid direct contact:
  As a general rule, only touch electrostatic sensitive devices when this is unavoidable (e.g. during maintenance work). Handle the modules without touching any chip pins or PCB traces. In this way, the discharged energy can not affect the sensitive devices. Discharge your body before you start taking any measurements on a module. Do so by touching grounded metallic parts. Always use grounded measuring instruments.
The unmatched complete service for the entire life cycle

For machine constructors, solution providers and plant operators: The service offering from Siemens Industry Automation and Drive Technologies includes comprehensive services for a wide range of different users in all sectors of the manufacturing and process industry.

To accompany our products and systems, we offer integrated and structured services that provide valuable support in every phase of the life cycle of your machine or plant – from planning and implementation through commissioning as far as maintenance and modernization.

Our Service & Support accompanies you worldwide in all matters concerning automation and drive technology from Siemens. We provide direct on-site support in more than 100 countries through all phases of the life cycle of your machines and plants.

You have an experienced team of specialists at your side to provide active support and bundled know-how. Regular training courses and intensive contact among our employees – even across continents – ensure reliable service in the most diverse areas.

Online Support

The comprehensive online information platform supports you in all aspects of our Service & Support at any time and from any location in the world.

You can find Online Support at the following address Internet.
Technical Consulting
Support in planning and designing your project: From detailed actual-state analysis, definition of the goal and consultation on product and system questions right through to the creation of the automation solution.

Technical Support
Expert advice on technical questions with a wide range of demand-optimized services for all our products and systems.
You can find Technical Support at the following address: Internet.

Training
Extend your competitive edge – through practical know-how directly from the manufacturer.
You can find the training courses we offer at the following address: Internet.

Engineering Support
Support during project engineering and development with services fine-tuned to your requirements, from configuration through to implementation of an automation project.

Field Service
Our Field Service offers you services for commissioning and maintenance – to ensure that your machines and plants are always available.

Spare parts
In every sector worldwide, plants and systems are required to operate with constantly increasing reliability. We will provide you with the support you need to prevent a standstill from occurring in the first place: with a worldwide network and optimum logistics chains.

Repairs
Downtimes cause problems in the plant as well as unnecessary costs. We can help you to reduce both to a minimum – with our worldwide repair facilities.

Optimization
During the service life of machines and plants, there is often a great potential for increasing productivity or reducing costs.
To help you achieve this potential, we are offering a complete range of optimization services.
Modernization

You can also rely on our support when it comes to modernization – with comprehensive services from the planning phase all the way to commissioning.

Service programs

Our service programs are selected service packages for an automation and drives system or product group. The individual services are coordinated with each other to ensure smooth coverage of the entire life cycle and support optimum use of your products and systems.

The services of a Service Program can be flexibly adapted at any time and used separately.

Examples of service programs:

- Service contracts
- Plant IT Security Services
- Life Cycle Services for Drive Engineering
- SIMATIC PCS 7 Life Cycle Services
- SINUMERIK Manufacturing Excellence
- SIMATIC Remote Support Services

Advantages at a glance:

- Reduced downtimes for increased productivity
- Optimized maintenance costs due to a tailored scope of services
- Costs that can be calculated and therefore planned
- Service reliability due to guaranteed response times and spare part delivery times
- Customer service personnel will be supported and relieved of additional tasks
- Comprehensive service from a single source, fewer interfaces and greater expertise

Contact

At your service locally, around the globe: your partner for consultation, sales, training, service, support, spare parts... for the entire range of products supplied by Industry Automation and Drive Technologies.

You can find your personal contact in our contacts database on the Internet.
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