# X20(c)DO6529

## 1 General information

The module is equipped with 6 relay outputs.

- 6 digital outputs
- Relay module for 115 VAC
- 6 normally open contacts
- Single-channel isolated outputs

### Danger!

**Risk of electric shock!**

**The terminal block must only be allowed to conduct voltage when it is inserted. It must not under any circumstances be removed or inserted when voltage is applied or have voltage applied to it when it is removed.**

### Danger!

**The voltage classes on the terminal block must not be mixed! Only operation at mains voltage (e.g. 115 VAC) OR safety extra-low voltage (e.g. 24 VDC SELV) is permitted.**

## 2 Coated modules

Coated modules are X20 modules with a protective coating for the electronics component. This coating protects X20c modules from condensation and corrosive gases.
The modules' electronics are fully compatible with the corresponding X20 modules.

**For simplification purposes, only images and module IDs of uncoated modules are used in this data sheet.**

The coating has been certified according to the following standards:

- Condensation: BMW GS 95011-4, 2x 1 cycle
- Corrosive gas: EN 60068-2-60, method 4, exposure 21 days

## 3 Order data

| Model number | Short description | Figure |
|---|---|---|
| | **Digital outputs** |  |
| X20DO6529 | X20 digital output module, 6 relays, normally open contacts, 115 VAC / 0.5 A, 30 VDC / 1 A | |
| X20cDO6529 | X20 digital output module, coated, 6 relays, normally open contacts, 115 VAC / 0.5 A, 30 VDC / 1 A | |
| | **Required accessories** | |
| | **Bus modules** | |
| X20BM11 | X20 bus module, 24 VDC keyed, internal I/O supply continuous | |
| X20BM15 | X20 bus module, with node number switch, 24 VDC keyed, internal I/O supply continuous | |
| X20cBM11 | X20 bus module, coated, 24 VDC keyed, internal I/O supply continuous | |
| | **Terminal blocks** | |
| X20TB12 | X20 terminal block, 12-pin, 24 VDC keyed | |

Table 1: X20DO6529, X20cDO6529 - Order data

# 4 Technical data

| Model number | X20DO6529 | X20cDO6529 |
|---|---|---|
| **Short description** | | |
| I/O module | 6 digital outputs 30 VDC / 115 VAC, outputs are single-channel isolated | |
| **General information** | | |
| B&R ID code | 0x2019 | 0xE751 |
| Status indicators | I/O function per channel, operating state, module status | |
| Diagnostics | | |
| Module run/error | Yes, using status LED and software | |
| Outputs | Yes, using status LED | |
| Power consumption | | |
| Bus | 1.1 W | |
| Internal I/O | - | |
| Additional power dissipation caused by actuators (resistive) [W] [1)] | +0.45 | |
| Certifications | | |
| CE | Yes | |
| KC | Yes | - |
| EAC | Yes | |
| UL | cULus E115267<br>Industrial control equipment | |
| HazLoc | cCSAus 244665<br>Process control equipment<br>for hazardous locations<br>Class I, Division 2, Groups ABCD, T5 | |
| ATEX | Zone 2, II 3G Ex nA nC IIA T5 Gc<br>IP20, Ta (see X20 user's manual)<br>FTZÚ 09 ATEX 0083X | |
| DNV GL | Temperature: **B** (0 - 55°C)<br>Humidity: **B** (up to 100%)<br>Vibration: **B** (4 g)<br>EMC: **B** (bridge and open deck) | |
| LR | ENV1 | - |
| KR | Yes | |
| **Digital outputs** | | |
| Variant | Relay / Normally open contact<br>Channels are single-channel isolated | |
| Nominal voltage | 30 VDC / 115 VAC | |
| Max. voltage | 125 VAC | |
| Switching voltage | Max. 110 VDC / 125 VAC | |
| Rated frequency | DC / 45 to 63 Hz | |
| Nominal output current | 1 A at 30 VDC / 0.5 A at 115 VAC | |
| Total nominal current | 6 A at 30 VDC / 3 A at 115 VAC | |
| Actuator power supply | External | |
| Inrush current | Max. 2 A (per channel) | |
| Contact resistance | 75 mΩ at 6 VDC / 1A | |
| Switching delay | | |
| 0 → 1 | ≤4 ms | |
| 1 → 0 | ≤4 ms | |
| Isolation voltages | | |
| Channel - Bus | Tested at 1500 VAC | |
| Channel - Channel | Tested at 1000 VAC | |
| Service life | | |
| Electrical [2)] | Min. 100 x $10^3$ ops. | |
| Mechanical | Min. 50 x $10^6$ ops. (3 Hz) | |
| Switching capacity | | |
| Minimum | 0.01 mA / 10 mV DC | |
| Maximum | 30 W / 62.5 VA | |
| Protective circuit | | |
| Internal | None | |
| External | | |
| AC | RC combination or VDR | |
| DC | Inverse diode, RC combination or VDR | |
| **Electrical properties** | | |
| Electrical isolation | Channel isolated from channel and bus | |
| **Operating conditions** | | |
| Mounting orientation | | |
| Horizontal | Yes | |
| Vertical | Yes | |
| Installation elevation above sea level | | |
| 0 to 2000 m | No limitations | |
| >2000 m | Reduction of ambient temperature by 0.5°C per 100 m | |
| Degree of protection per EN 60529 | IP20 | |

Table 2: X20DO6529, X20cDO6529 - Technical data

| Model number | X20DO6529 | X20cDO6529 |
|---|---|---|
| **Ambient conditions** | | |
| Temperature | | |
| Operation | | |
| Horizontal mounting orientation | -25 to 60°C | |
| Vertical mounting orientation | -25 to 50°C | |
| Derating | See section "Derating" | |
| Storage | -40 to 85°C | |
| Transport | -40 to 85°C | |
| Relative humidity | | |
| Operation | 5 to 95%, non-condensing | Up to 100%, condensing |
| Storage | 5 to 95%, non-condensing | |
| Transport | 5 to 95%, non-condensing | |
| **Mechanical properties** | | |
| Note | Order 1x X20TB12 terminal block separately<br>Order 1x X20BM11 bus module separately | Order 1x X20TB12 terminal block separately<br>Order 1x X20cBM11 bus module separately |
| Spacing | 12.5$^{+0.2}$ mm | |

Table 2: X20DO6529, X20cDO6529 - Technical data

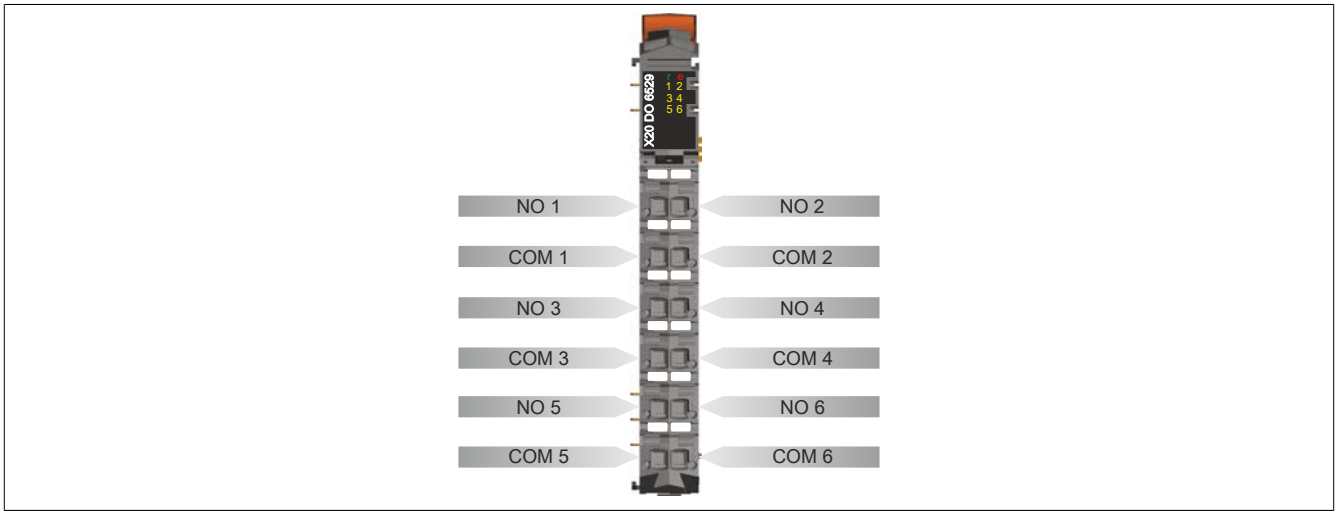
1) Number of outputs x Contact resistance x Nominal output current$^2$. For a calculation example, see section "Mechanical and electrical configuration" of the X20 system user's manual.
2) With a resistive load. See also section "Electrical service life"

# 5 Status LEDs

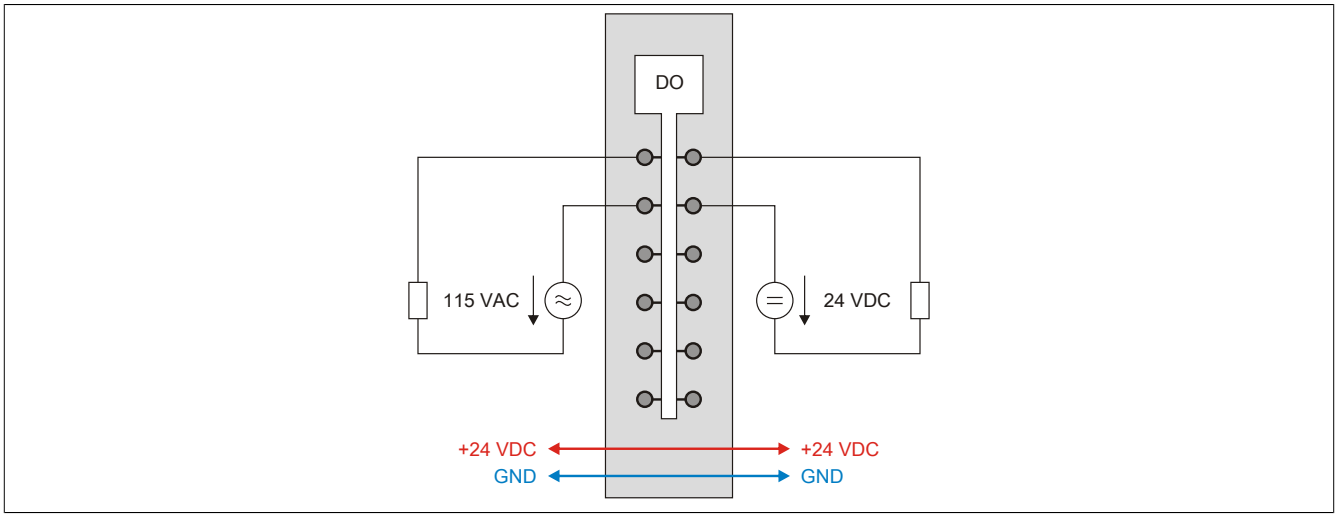
For a description of the various operating modes, see section "Additional information - Diagnostic LEDs" of the X20 system user's manual.

| Figure | LED | Color | Status | Description |
|---|---|---|---|---|
|  | r | Green | Off | Module supply not connected |
| | | | Single flash | RESET mode |
| | | | Blinking | PREOPERATIONAL mode |
| | | | On | RUN mode |
| | e | Red | Off | Module supply not connected or everything OK |
| | | | On | Error or reset status |
| | e + r | Red on / Green single flash | | Invalid firmware |
| | 1 - 6 | Orange | | Output status of the corresponding digital output |

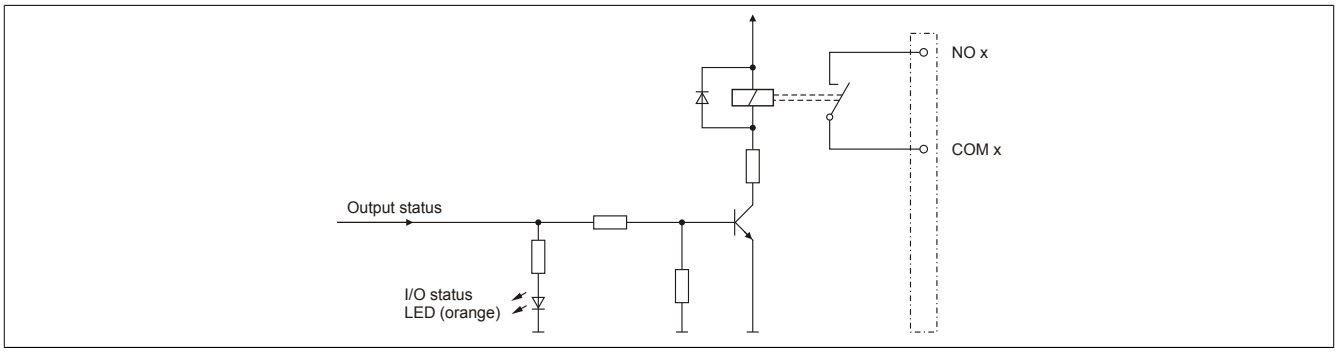
# 6 Pinout



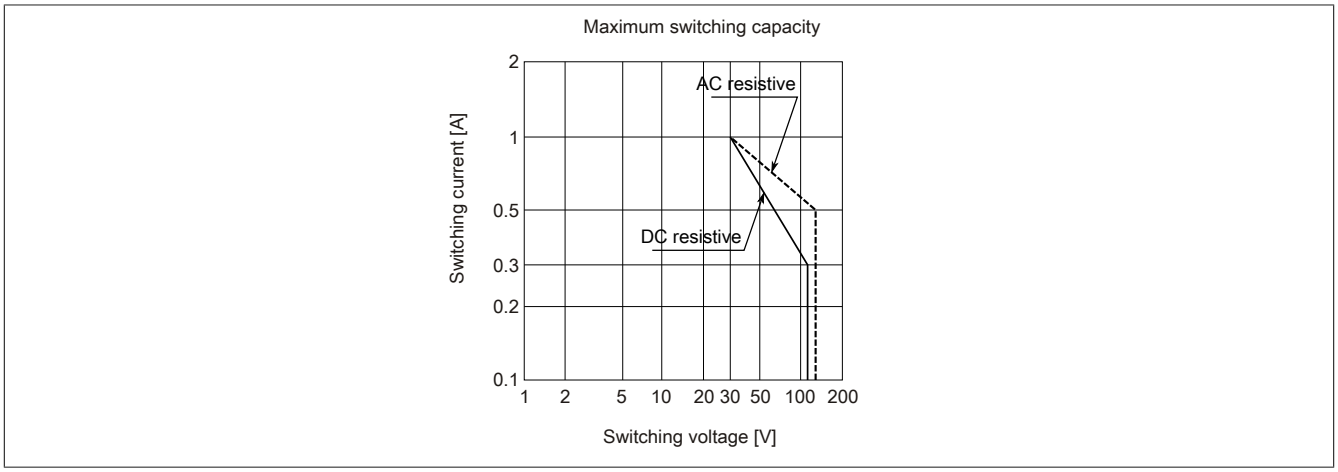
# 7 Connection example



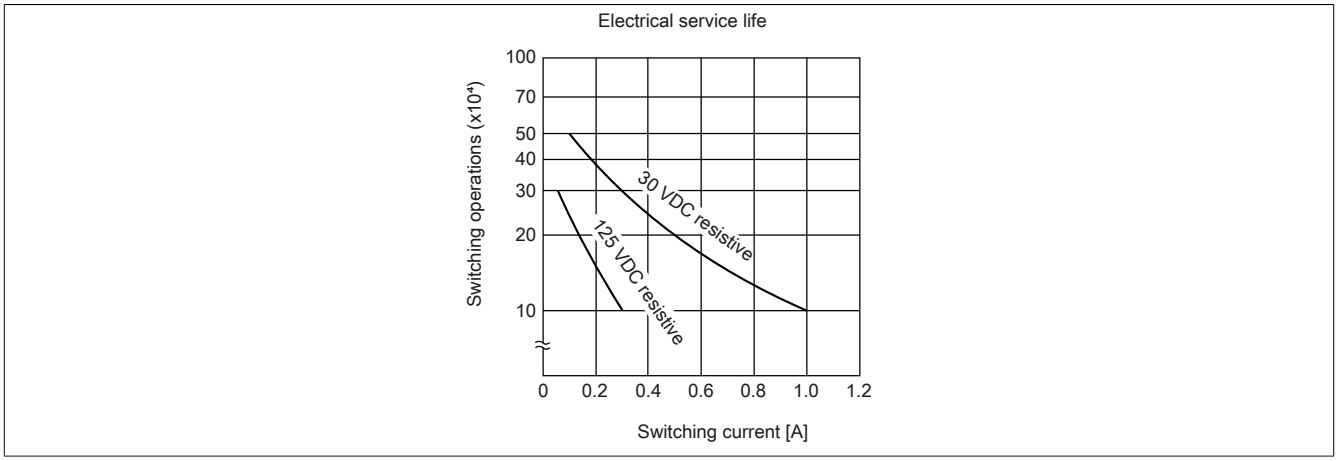

# 8 Output circuit diagram




# 9 Maximum switching power



## 10 Electrical service life

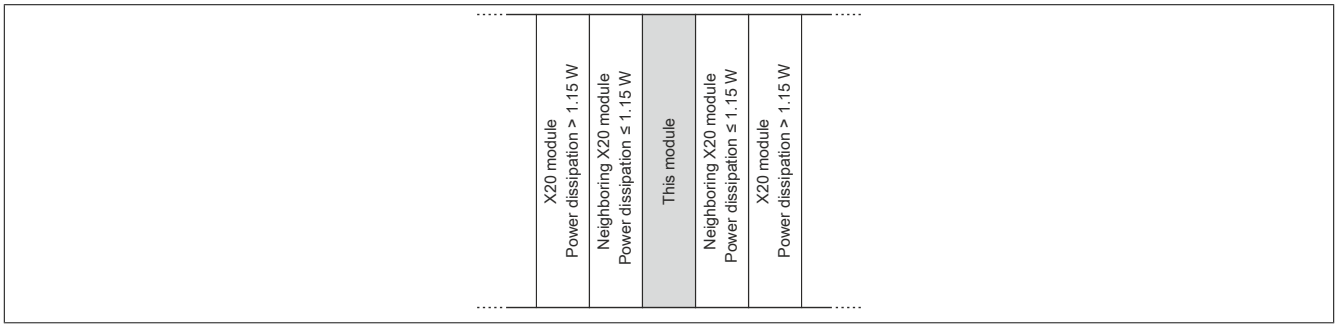



## 11 Derating

There is no derating when operated below 55°C.

During operation over 55°C, the power dissipation of the modules to the left and right of this module is not permitted to exceed 1.15 W!

For an example of calculating the power dissipation of I/O modules, see section "Mechanical and electrical configuration - Power dissipation of I/O modules" in the X20 user's manual.



# 12 Register description

## 12.1 General data points

In addition to the registers described in the register description, the module has additional general data points. These are not module-specific but contain general information such as serial number and hardware variant.

General data points are described in section "Additional information - General data points" of the X20 system user's manual.

## 12.2 Function model 0 - Standard

| Register | Fixed offset | Name | Data type | Read | | Write | |
|---|---|---|---|---|---|---|---|
| | | | | Cyclic | Acyclic | Cyclic | Acyclic |
| 2 | 0 | DigitalOutput | USINT | | | • | |
| | | DigitalOutput01 | Bit 0 | | | | |
| | | ... | ... | | | | |
| | | DigitalOutput06 | Bit 5 | | | | |

Fixed modules require their data points to be in a specific order in the X2X frame. Cyclic access occurs according to a predefined offset, not based on the register address.

Acyclic access continues to be based on the register numbers.

## 12.3 Function model 254 - Bus Controller

| Register | Offset[1)] | Name | Data type | Read | | Write | |
|---|---|---|---|---|---|---|---|
| | | | | Cyclic | Acyclic | Cyclic | Acyclic |
| 2 | 0 | Switching state of digital outputs 1 to 6 | USINT | | | • | |
| | | DigitalOutput01 | Bit 0 | | | | |
| | | ... | ... | | | | |
| | | DigitalOutput06 | Bit 5 | | | | |

1) The offset specifies where the register is within the CAN object.

### 12.3.1 Using the module on the bus controller

Function model 254 "Bus controller" is used by default only by non-configurable bus controllers. All other bus controllers can use additional registers and functions depending on the fieldbus used.

For detailed information, see section "Additional information - Using I/O modules on the bus controller" of the X20 user's manual (version 3.50 or later).

### 12.3.2 CAN I/O bus controller

The module occupies 1 digital logical slot on CAN I/O.

## 12.4 Digital outputs

The output status is transferred to the output channels with a fixed offset (<60 µs) based on the network cycle (SyncOut).

### 12.4.1 Switching state of digital outputs 1 to 6

Name:
DigitalOutput
DigitalOutput01 to DigitalOutput06

The switching state of digital outputs 1 to 6 are stored in this register.

Only function model 0 - Standard:

Setting "Packed outputs" in the Automation Studio I/O configuration determines whether all bits of this register should be applied individually as data points in the Automation Studio I/O assignment ("DigitalOutput01" to "DigitalOutput0x") or whether this register should be displayed as a single USINT data point ("DigitalOutput").

| Data type | Values | Information |
|---|---|---|
| USINT | 0 to 63 | Packed outputs = On |
| | See bit structure. | Packed outputs = Off or Function model <> 0 - Standard |

Bit structure:

| Bit | Name | Value | Information |
|---|---|---|---|
| 0 | DigitalOutput01 | 0 | Digital output 01 reset |
| | | 1 | Digital output 01 set |
| ... | | ... | |
| 5 | DigitalOutput06 | 0 | Digital output 06 reset |
| | | 1 | Digital output 06 set |

## 12.5 Minimum cycle time

The minimum cycle time specifies the time up to which the bus cycle can be reduced without communication errors occurring. It is important to note that very fast cycles reduce the idle time available for handling monitoring, diagnostics and acyclic commands.

| Minimum cycle time |
|---|
| 100 µs |

## 12.6 Minimum I/O update time

The minimum I/O update time specifies how far the bus cycle can be reduced so that an I/O update is performed in each cycle.

| Minimum I/O update time |
|---|
| Equal to the minimum cycle time |