PERFECT SOLUTIONS FOR **GAS ALARM** SYSTEMS

Technical Datasheet

PolyGard®2

Multi-Sensor-Controller MSC2
Multi-Sensor-Board MSB2
Multi-Gas-Controller MGC2

YouTube Video

Specifications subject to change without notice.

All Products Made in Germany

DESCRIPTION

Gas measuring, monitoring and warning controller based on state-of-the-art micro-technology for continuous monitoring of the ambient air to detect toxic and combustible gases, refrigerants or oxygen.

MSC2

The Multi-Sensor-Controller MSC2 is designed for the connection of max. 3 sensors in total, max. 2 of them may be different sensors of the SC2 series via local bus and/or max. 2 of them analog sensors with 4–20 mA signal. The controller monitors the measured values and activates the alarm relays if the set alarm thresholds for pre-alarm and main alert are exceeded. In addition, the values are provided for direct connection to the BMS via an RS-485 interface and also as 4–20 mA output.

The MSC2 system for wet areas has an input for remote connection of a digital sensor (SC2-Remote) via the local bus that transmits the temperature-compensated measurement value in digital form. The main alarm is additionally signalized by the remote optical and acoustic warning unit WAO (buzzer and the 3-colour status LED, alarm-fault-operation-service). Sensor and warning unit are protected against splash water.

MSB2

The Multi-Sensor-Board MSB2 is designed for the connection of max. 3 sensors in total, max. 2 of them may be different sensors of the SC2 series via local bus and/or max. 3 of them analog sensors with 4–20 mA signal. The MSB2 provides the power supply of the SC2(s) and makes the measured data available for digital communication and for the 4–20 mA output. Communication with the DGC-06 controller takes place via the RS-485 field bus interface with DGC-06 protocol. The alarm relays can be controlled both via the DGC-06 controller and locally via the measurement signals. The digital input for acknowledgment or test function and other options such as display or various communication protocols for direct connection to superordinate BMS ensure the adaptation to the wide range of applications in gas detection technology.

MGC2

The Multi-Gas-Controller MGC2 is designed for the connection of max. 3 analog sensors with 4–20 mA signal, e.g. of the MC2 series. The controller monitors the measured values and activates the alarm relays if the set alarm thresholds for pre-alarm and main alert are exceeded. In addition, the values are provided for direct connection to a superior BMS via an RS-485 interface and also as 4–20 mA output.

General

The SIL2 compliant self-monitoring function in the board and in the connected sensor activates the fault message in case of an internal error as well as in case of a fault in the local bus communication (SC2) and/or at the 4–20 mA input / output current signals.

Other options such as LCD display, 3-color status LED, buzzer, digital input for acknowledgment or test function, various communication protocols ensure proper adaptation to the wide range of applications in gas detection technology. For convenient commissioning the MSC2/MGC2 can be pre-configured and parametrised with factory-set defaults.

APPLICATION

The **PolyGard®2 Multi-Sensor-Controller MSC2** is designed for detection and warning of toxic and combustible gases, refrigerants or oxygen in many commercial and industrial applications.
Special application possibilities of the controller such as wet area or in combination with the DEM-06-IO Door Entrance Module are offered as packages. In industrial applications with increased electromagnetic interference fields, technical malfunctions may occur with the MSC2.

The **PolyGard®2 Multi-Sensor-Board MSB2** is used for integration of the SC2 sensors and for transmission or local processing of the measured values.

The **PolyGard®2 Multi-Gas-Controller MGC2** is designed for detection and warning of gases in many commercial and industrial applications.

FEATURES

- Internal function monitoring with integrated hardware watchdog
- Hardware and software according to SIL compliant development process
- Easy maintenance/calibration by replacing the sensor or via comfortable on-site calibration
- Modular technology (plug-in and exchangeable)
- Reverse polarity protected, overload and short-circuit proof
- **MSC2 standard**: Local bus connection for 2x sensor SC2 & 2x analog inputs 4–20 mA, for e.g. MC2 series (max. 3 sensors in total) or
- **MSC2 for wet area**: Local bus connection for 1x sensor SC2 incl. splash protection in separate housing type A, remote WAO unit (**W**arning **A**coustic-**O**ptic) with splash guard, mounted on D housing, with status LED (for warning, fault, operation and service) and warning buzzer
- **MSB2**: Local bus connection for 2x sensor SC2 & 3x analog inputs 4–20 mA, for e.g. MC2 series (max. 3 sensors in total)
- **MGC2**: 3x analog inputs 4–20 mA, for e.g. MC2 series
- 3 relays with SPDT contacts, potential-free max. 250 V AC, 5 A
- 2 transistor outputs, 24 V DC, 0.1 A (plus switching)
- Serial RS-485 interface with protocol for DGC-06 or Modbus protocol
- 2 digital inputs
- LCD display (option)
- Warning buzzer and status LED for alarm, fault, operation and service (option)
- Acknowledgment button (option)
- **MSC2**: Operating voltage 230 V AC with wide range input 100–240 V AC (option)
- UPS (option)
- Conformity to:
  - EN 50271 (MSC2, MSB2, MGC2)
  - EN 50270 Typ I (MSC2)
  - IEC/EN 61508-1–3 (MSC2, MGC2)
  - EN 60079-29-1 (MSC2, MGC2)
  - EN 50104 (MSC2)
  - EN 45544 (MSC2)
  - EN 50545 (MSC2)
  - EN 14624 (MSC2)
  - EN 60335 (MSC2)
- ANSI/UL 61010 1 & CAN/CSA-C22.2 No. 61010-1 (option)

SPECIFICATIONS

ELECTRICAL	
MSC2/MGC2 power supply	24 V DC ± 20 %, reverse-polarity protected 24 V AC ± 15 %, (only 1x SC2 connected)
MSB2 power supply	16–29 V DC, reverse-polarity protected
MSC2/MGC2 power consumption (24 VDC)	
- Control Board	Max. 60 mA (1.5 VA), w/o sensor, w/o WAO
- Per sensor (SC2 or MC2)	Max. 85 mA (2.1 VA)
- Horn / warning light	Max. 40 mA (1.0 VA)
MSB2 power consumption (24 V DC)	100 mA (2,4 VA), w/o sensor, w/o WAO
Alarm relay (3)	250 V AC, 5 A; 30 V DC, 2 A, potential-free, contacts (SPDT)
Transistor output (2)	24 V DC/0,1 A (switching to plus) only at 24 V DC power supply
Digital input (2)	Potential-free
Analog input (2/3)	4–20 mA, overload and short-circuit proof, input resistance 200 Ω
Analog output signal (1)	Proportional, overload and short-circuit proof, load ≤ 500 Ω 4–20 mA = measuring range 2.4–< 4 mA = underrange > 20–21.2 mA = overrange 2.0 mA = fault
Output for local bus	5 V DC, 250 mA max., overload, short-circuit and reverse-polarity protected
SERIAL INTERFACE	
Local bus (MSC2/MSB2)	1-wire / 19200 Baud
Field bus	RS-485 / 19200 Baud
Tool bus	2-wire / 19200 Baud
AMBIENT CONDITIONS	
Temperature range	-25 °C to +60 °C (with option LC-Display -20°C to +60°C)
Humidity range	15–95 % RH non-condensing
Storage temperature	-20 °C to +65 °C
Storage time	Ca. 6 months
PHYSICAL	
Housing type A/C/E	Polycarbonate
Burning behaviour	UL 94 V2
Housing colour	RAL 7032 (light grey)
Dimensions housing (B x H x T)	
Housing type A	94 x 130 x 57 mm (3.70 x 5.12 x 2.24 in.)
Housing type C	130 x 130 x 75 mm (5.12 x 5.12 x 2.95 in.)
Housing type E	130 x 130 x 99 mm (5.12 x 5.12 x 3.90 in.)
Weight	Max. 0.6 kg (1.32 lbs)
Protection class (delivery state*)	IP65
Installation	Wall mounting
Knockouts for cable entry	Standard 6x M20/25
Connection type: Local bus (SC2)	Plug-in connector, 3-pin
Digital input, analog output	Screw-type terminals, 0.25–1.3 mm^2
Power supply, relays, field bus	Screw-type terminals, 0.25–2.5 mm^2
REGULATIONS	
Directives	EMC Directives 2014/30/EU Low Voltage Directive 2014/35/EU CE EN 61010-1:2010 Conformity to: EN 50271 (also MSB2), EN 50270 Type I, IEC/EN 61508-1–3, EN 60079-29-1, EN 50104, EN 45544, EN 50545, EN 14624, EN 60335 Option: ANSI/UL 61010-1 CAN/CSA-C22.2 No. 61010-1
Warranty	1 year on sensor (not if poisoned or overloaded), 2 years on device

* If there are changes to the housing it has to be re-evaluated.

OPTIONS	
DISPLAY	
LC-Display	2 lines, 16 characters each, background highlighted, 2 colours
Operation	Menu driven via 6 pushbuttons
Power consumption	5 V, 60 mA, 0.3 VA
WAO STATUS-LED/BUZZER	
Colour/mode	Red/yellow/green (alarm-fault-operation-service)
Acoustic pressure	> 85 dB (A) (distance 0.1 m)
Frequency	2300 Hz ± 300 Hz
Protection class	IP65
POWER SUPPLY 110 / 230 V AC	
Wide range input	100–240 V AC - 50/60 Hz
Output rating type 5	5 VA
Output rating type 7	15 VA
UPS (NOT FOR MSC2 WET AREA VERSION)	
Power unit with wide range input	100–240 V AC - 50/60 Hz
Output rating power pack	15 VA
Rechargeable battery (2x)	12 V, 0.8 Ah
Operating time	> 60 min
POWER SUPPLY 12 V DC (NOT FOR MSC2 WET AREA VERSION)	
Power supply	12 V DC reverse-polarity protected
Power consumption (12 V DC) - Control Board - per sensor (SC2 or MC2) - horn / warning light	 Max. 120 mA (1.5 VA), w/o sensor, w/o WAO Max. 170 mA (2.1 VA) Max. 80 mA (1.0 VA)

All specifications were collected under optimal test conditions.
We confirm compliance with the minimum requirements of the applicable standard.

SENSOR CONNECTION OPTIONS

Sensor Connection Options	SC2 Sensors via Local Bus	MC2 Sensors with 4–20 mA Signal
MSC2 Standard Max. 3	0	1–2
	1	0–2
	2	0–1
	3	0
MSC2 Wet Area Version Max. 1	1 (remote)	0
MSB2	0	1–3
	1	0–2
	2	0–1
MGC2	0	1–3

ELECTRICAL CONNECTION

Note:

- Relay No. 3 is always energized.
- The connection of 2x SC2 sensor heads with IR sensor is not allowed.
- It is not allowed to connect 2x SC2 sensor heads of the same gas or the same gas group (Freons).
- When connecting 2x MC2, at least 1x must be an electrochemical sensor from the MC2-E11XX series.
- In AC mode, only 1x SC2 sensor head from the P34XX, SXXX, I-S11XX or I4XX series may be connected.
- For the 5 VA version, only 1x of all connected MC2/SC2 sensors may be from the P34XX, SXXX, I-S11XX or I4XX series due to the required power.

MSC2, 24 V DC or 230 V AC, 5 VA

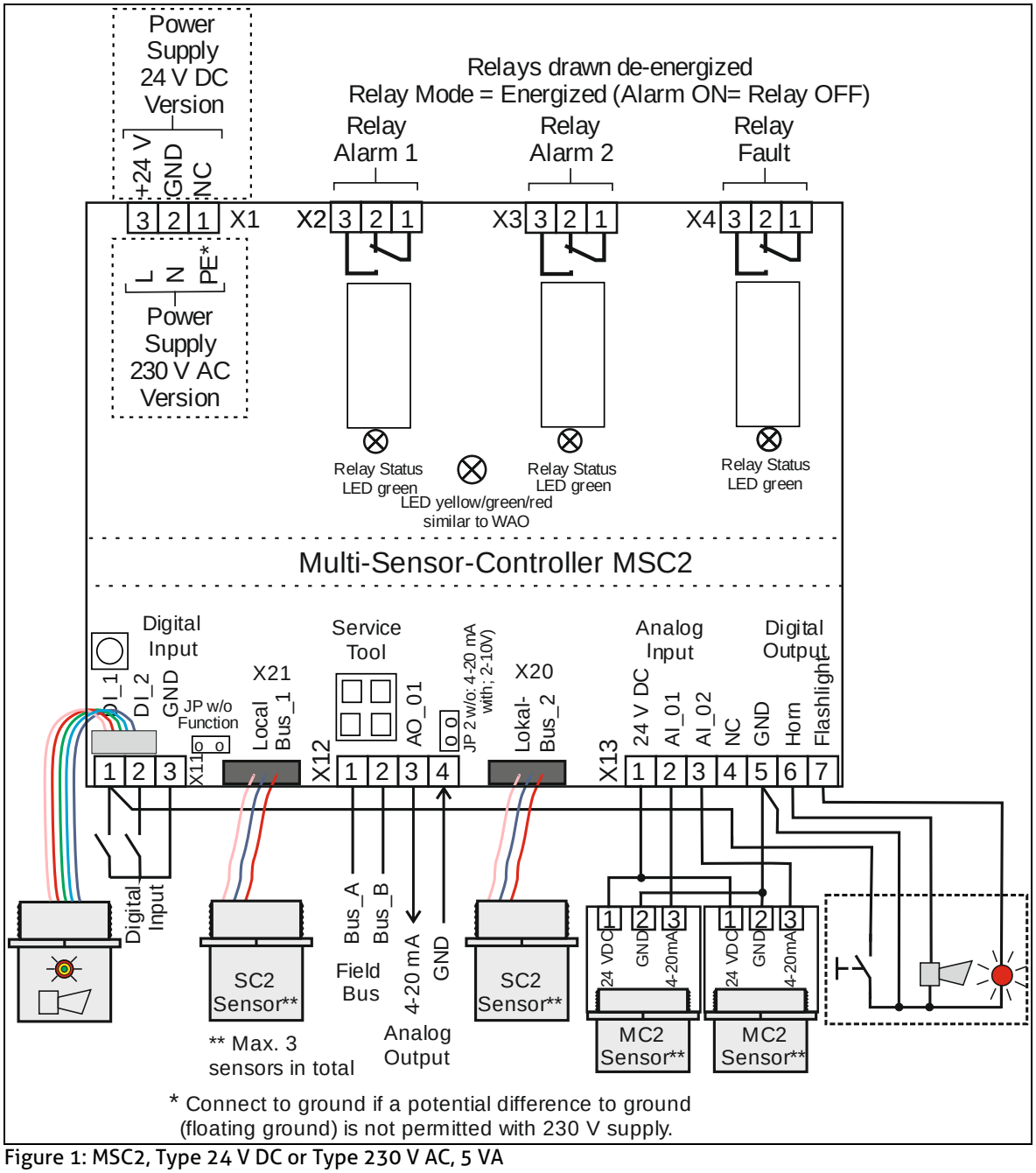

Figure 1: MSC2, Type 24 V DC or Type 230 V AC, 5 VA

MSC2, 230 V AC, 15 VA, Option UPS

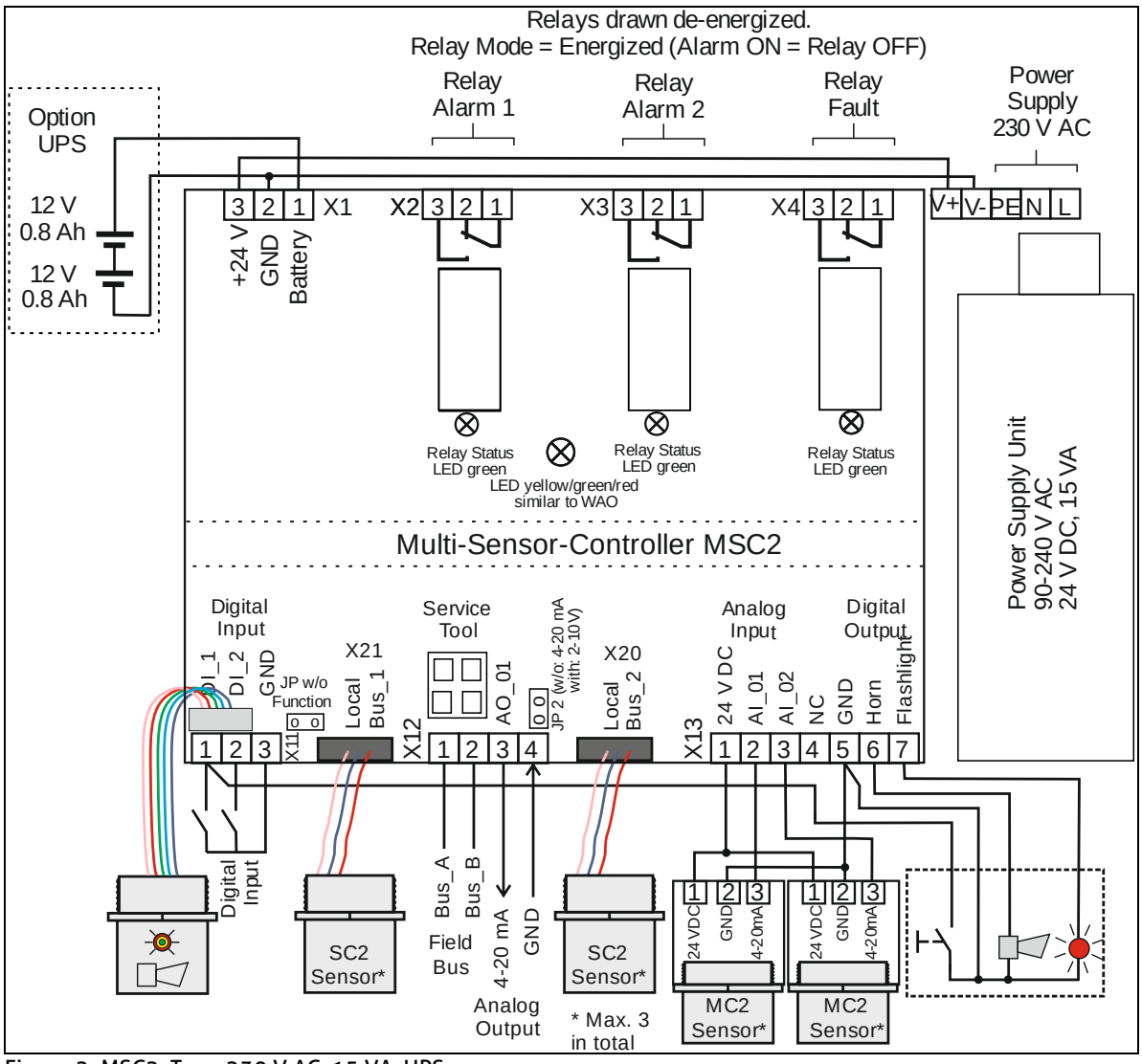

Figure 2: MSC2, Type 230 V AC, 15 VA, UPS

MSC2,24 V DC / 230 V AC, Wet Area

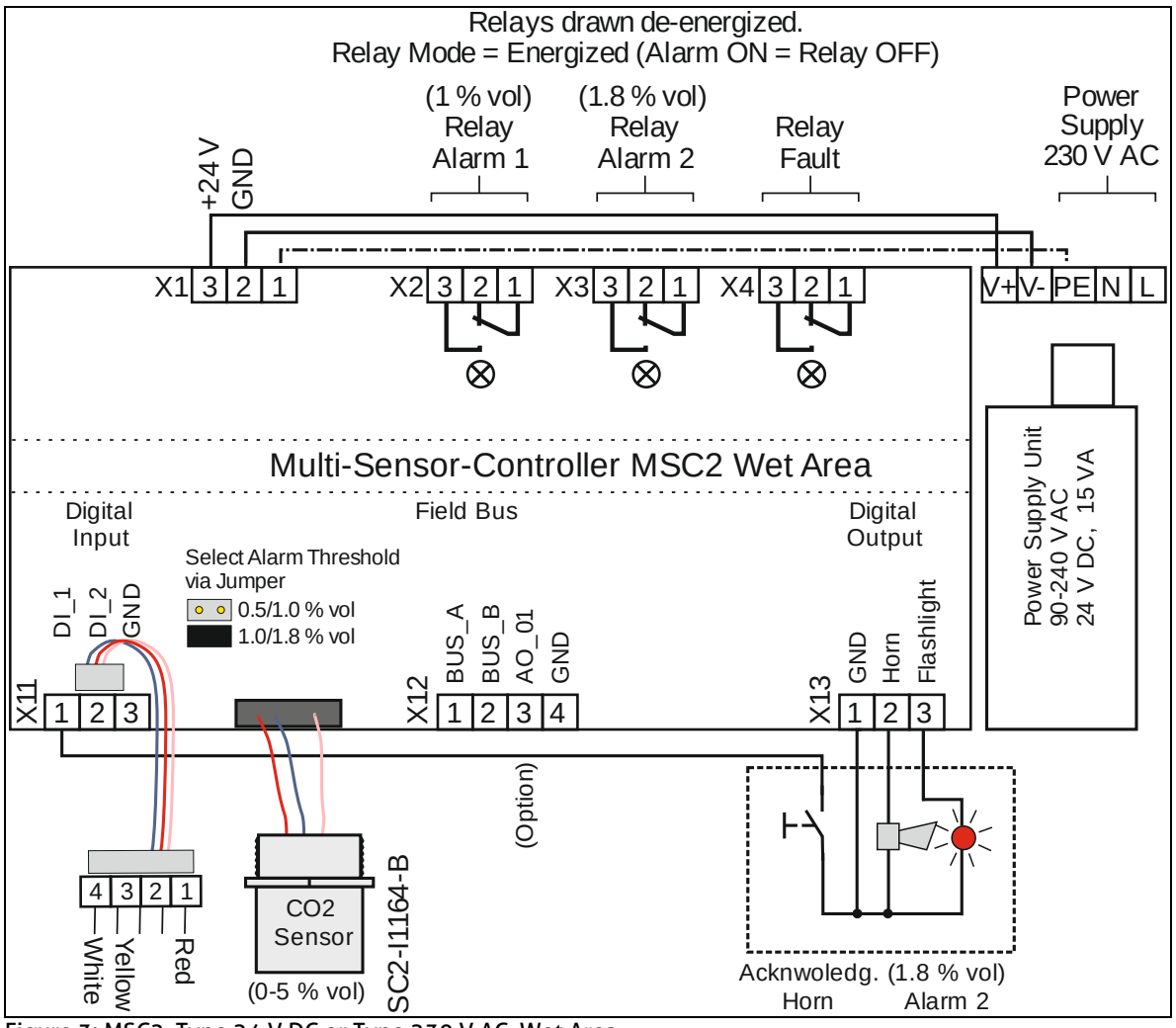

Figure 3: MSC2, Type 24 V DC or Type 230 V AC, Wet Area

MSB2

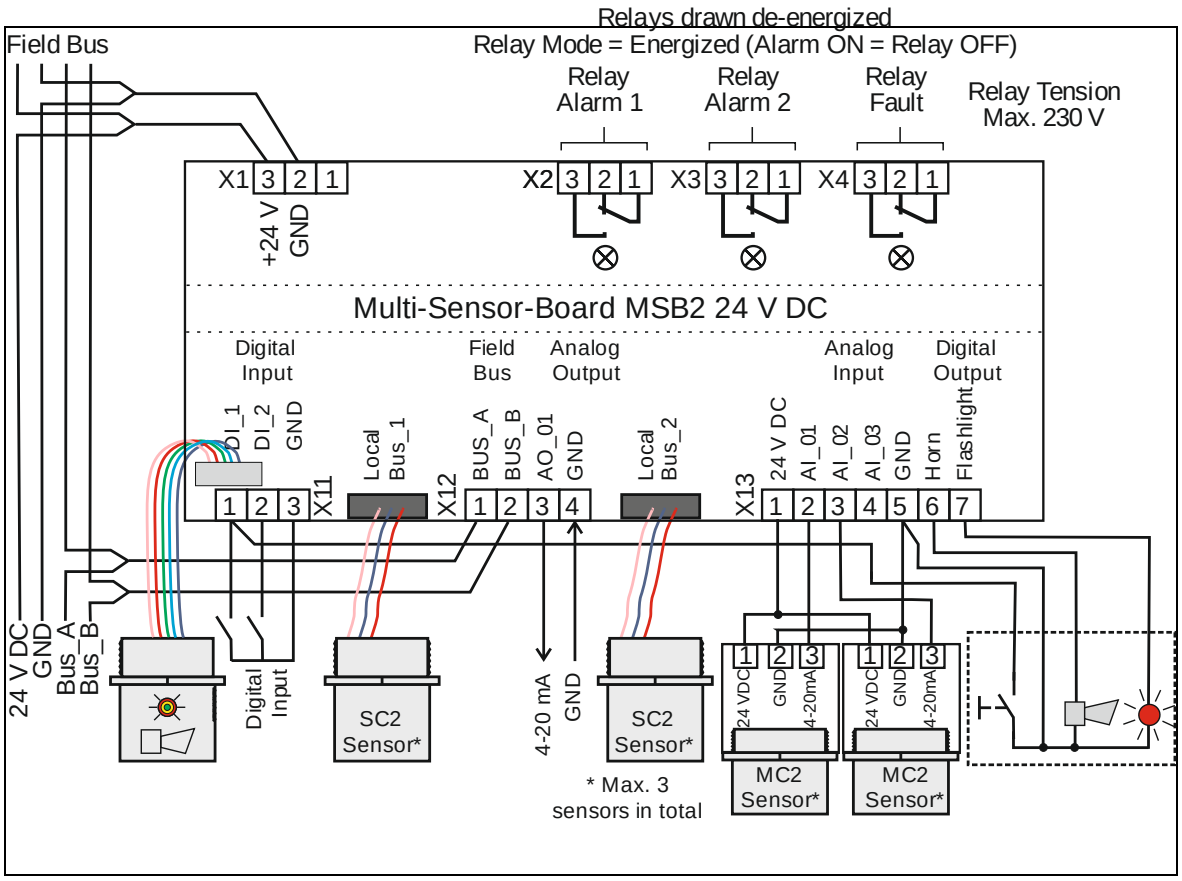

Figure 4: MSB2, Type 24 V DC

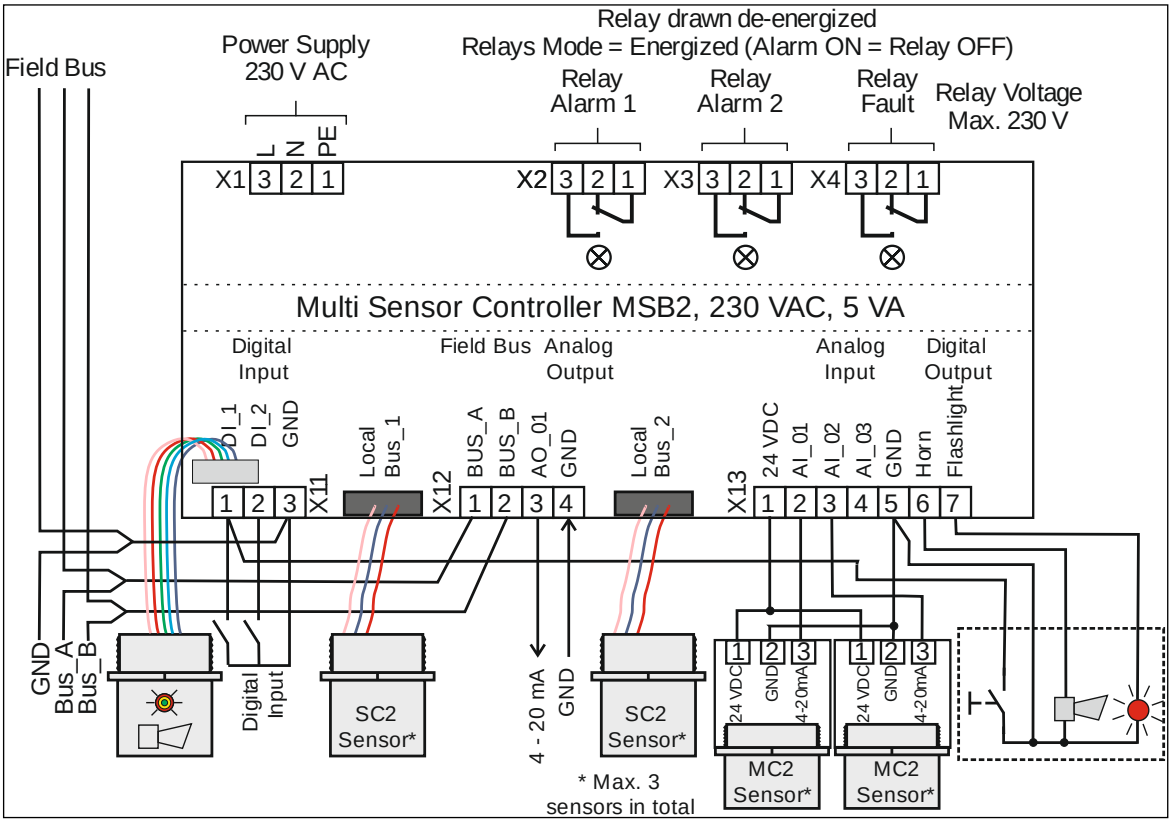

Figure 5: MSB2, Type 230 V AC

MGC2,24 V DC

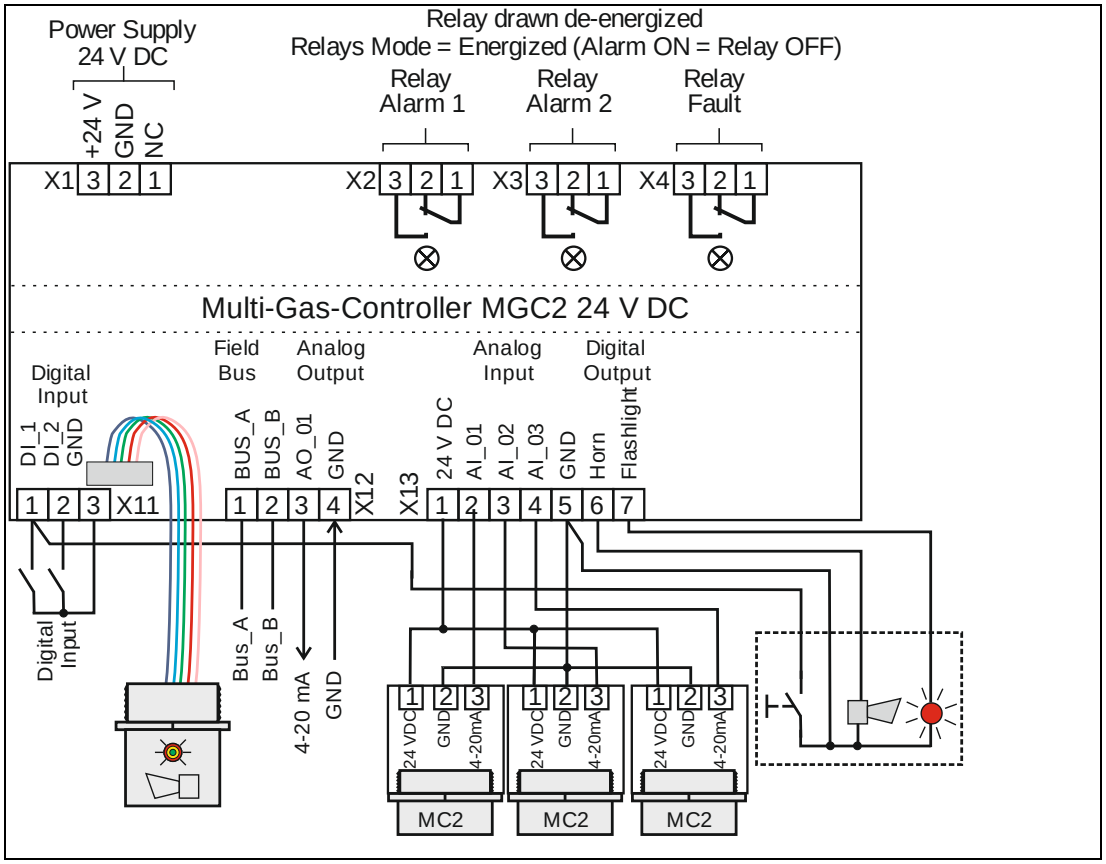

Figure 6: MGC2, Type 24 V DC

MGC2, 230 V DC, 5 VA

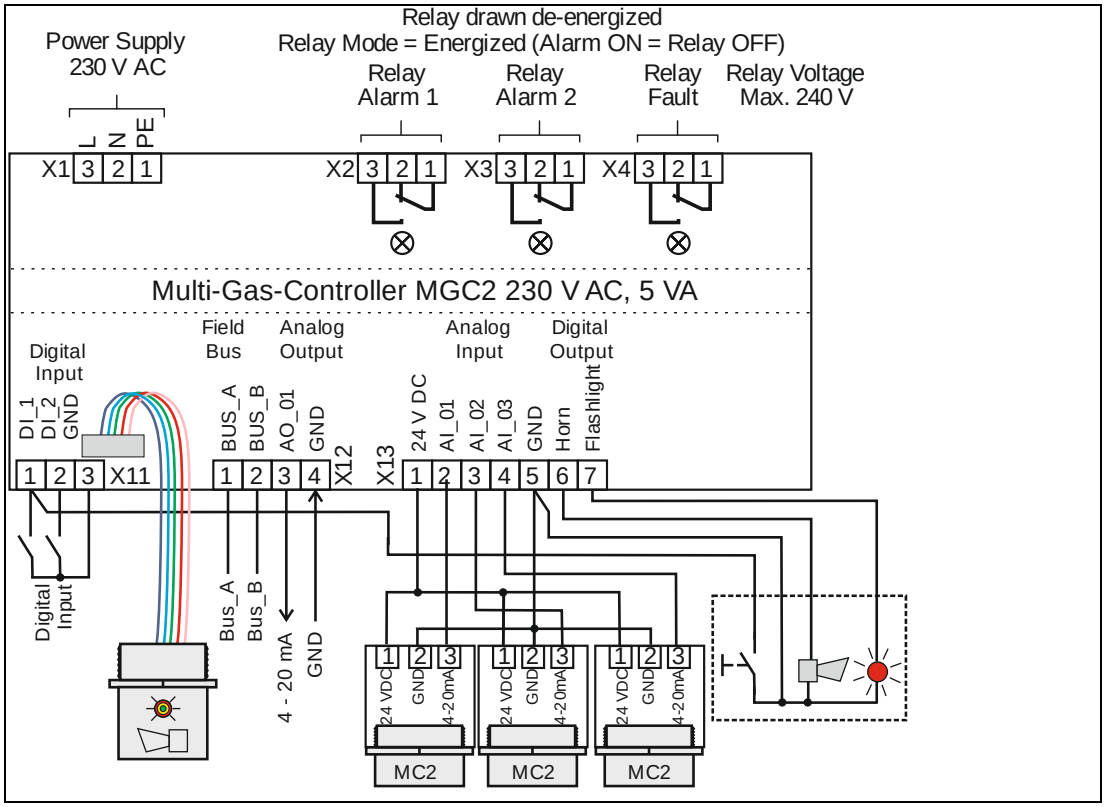

Figure 7: MGC2, Type 230 V DC and 5 VA

ORDERING INFORMATION

MSC2-
MSB2-
MGC2-

X- X 3 X 3 X X X X X

0	**No further options**	
A	Version UL/CSA 61010-1(housing A, C, E)	**Further options**
0	**No built-on warning device**	**Warning device**
0	**No display**	
2	With display/keypad	**Display**
2	**2x Analog input (MSC2)**	
3	3x Analog input (MSB2, MGC2)	**Analog input**
2	**2x Digital input**	
4[5]	1x Digital input and 1x reset button on the housing	**Digital input**
3	**Analog output & RS-485 with DGC-06 protocol (Modbus incl.)**	**Output signal**
0	**No buzzer & status LED**	
4	Buzzer & status LED (red, yellow, green)	
N	WAO-NB buzzer & status LED (red, yellow, green) with SplashGuard, on separate housing D (wet area version only)	**WAO**
3	**3x Alarm relays**	**Alarm relays**
1[*4]	12 V DC	
2[2]	**24 V DC / AC**	
5[3]	**100–240 V AC / 24 V DC, 5 VA**	
7	**100–240 V AC / 24 V DC, 15 VA**	
8[*4]	UPS 100–240 V AC / 12 V DC, 15 VA, 0.8 Ah	
9[4]	UPS 100–240 V AC / 24 V DC, 15 VA, 0.8 Ah	**Power supply**
0	No housing	
A[6]	Housing type A, 94 x 130 x 57 mm	
C[1]	**Housing type C, 130 x 130 x 75 mm**	
E	Housing type E, 130 x 130 x 99 mm	
P[4,5]	Door installation housing type P 150 x 96 x 50 mm	**Housing**

* On request
[1] Version with display and power supply 15 VA combined, only in housing type E
[2] In AC mode, only 1x **SC2** sensor head from the P34XX, SXXX, I-S11XX or I4XX series may be connected.
[3] Only 1x of all connected MC2/SC2 sensors may be from the P34XX, SXXX, I-S11XX or I4XX series due to the required power.
[4] Not possible for MSC2 wet area version.
[5] Not possible for MSB2.
[6] Only possible for MSB2 and MGC2, only 1x SC2 or 1x MC2, w/o WAO, w/o 100–240 V AC/15 VA, w/o UPS.

Standard versions MSC2
Order number:
MSC2-C-230322000
MSC2-C-730322000

VERSION WET AREA

SC2-Remote for Wet Area

SC2-	**XXXX(X)-X(X)-(X)-**	**N-**	**0,14**	
			0,14 Special cable 140 mm	**Cable extension**
		N	**Nassbereich Wet area: Sensor with SplashGuard, mounted in A housing**	**Sensor housing**
	Gas type		**Measuring range**	
	Gas type and measuring range, see data sheets DB_SC2			**Gas type/ Measuring range**

Example: MSC2 version wet area with 1x WAO and with 1x SC2 sensor for CO_2
Multi-Sensor-Controller MSC2 in housing type C with separate, splash protected WAO unit on housing type D **and** 1x SC2 Sensor for CO_2 with splash protection integrated in housing type A
Order number: MSC2-C-X3NXX2X0X **and** SC2-I-S1164-X-N-0,14

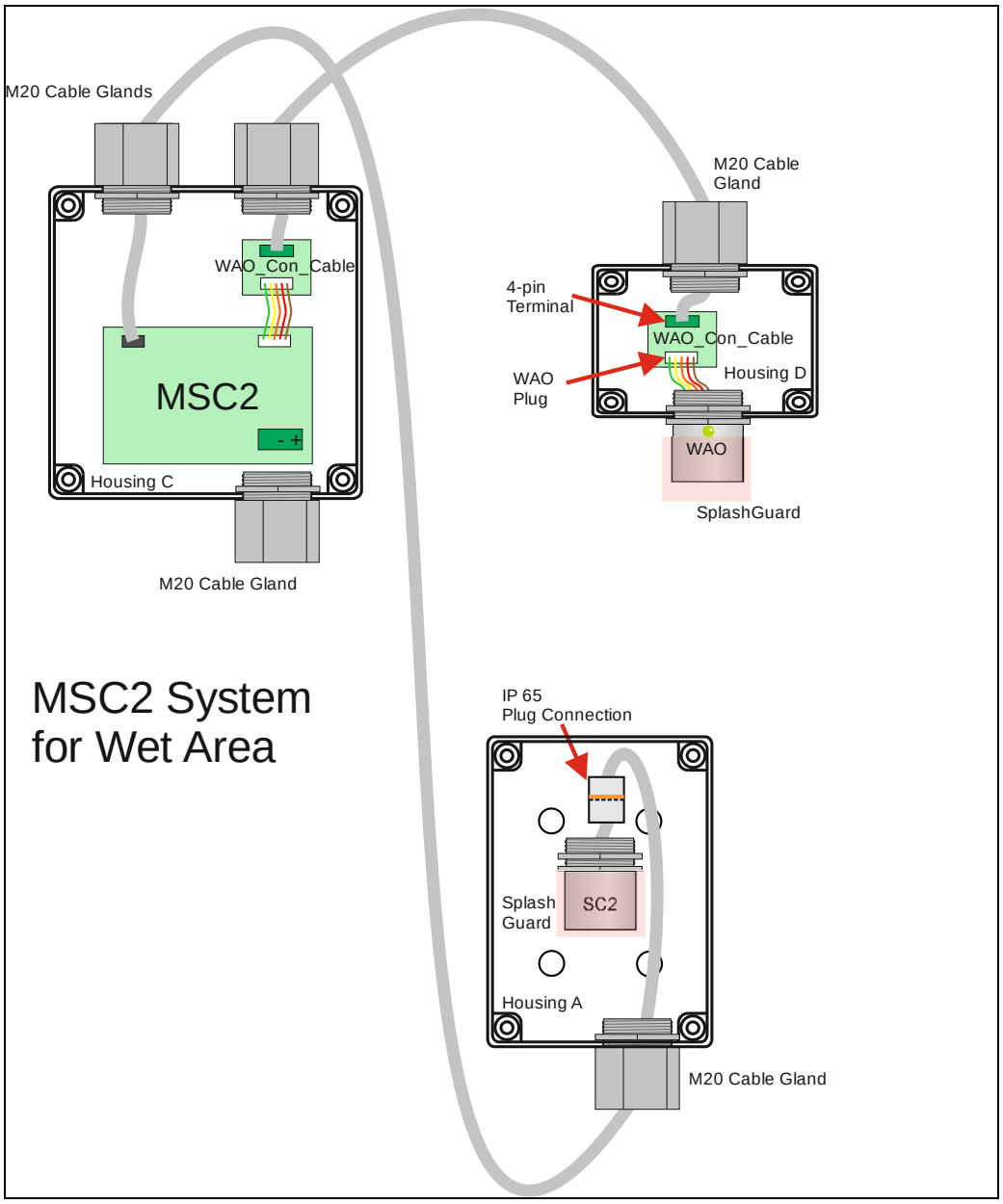

Figure 8: System for Wet Area