

PERFECT SOLUTIONS IN GAS DETECTION
GAS ALARM SYSTEMS



PRODUCT CATALOG 2013
for cooling systems



List of Approvals

ISO 9002 | TÜV - VDI 2053 | EC 61010 | UL 2075 | UL 1818 | GOST



Gateways

RS485 ModBus | BacNet | LON | GPRS | Others on request



GAS ALARM SYSTEMS Product Catalog 2013 for Cooling Systems

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For technical details please see the corresponding data sheets.
Subject to modifications.

Your Team

PERFECT SOLUTIONS IN GAS DETECTION

- Innovative and creative products
- Reliable in price, quality and availability
- Respect and responsibility to the customers and business partners
- Motivation and pleasure in the product
- Open-minded about new needs and markets

These are the factors having mainly influenced and still influencing the thinking and acting of MSR on its successful way to national innovation lead and to an offerer of need-oriented solutions in gas warning systems.



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MSR Electronic offers products for the optimum protection in critical situations for life and health in closed areas.

Whether for commercial or for industrial applications - for combustible or toxic gases - MSR Electronic only uses well proven, but innovative technology.



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μ-Gard® Analog Transmitter

Short term	Item number	Type of gas	Formula	Sensor type	Range ²
MA-NH3	MA-2-1120-D-E	Ammonia	NH ₃	El-chem.	0-1000 ppm
MA-O2	MA-9-1195-D-K	Oxygen	O ₂	El-chem.	0-25 vol%
MA-NH3P	MA-2-1120-D-M	Ammonia	NH ₃	Pellistor	0-100 %LEL
MA-EXP	MA-2-34XX-D-M	Combustible *		Pellistor	0-100 %LEL
MA-NH3H	MA-3-1120-D-Q	Ammonia	NH ₃	Semiconductor	0-300 ppm
MA-EXH	MA-4-3HXX-D-L	Combustible *		Semiconductor	0-50 %LEL
MA-ETO	MA-4-1H89-D-F	Ethylene	C ₂ H ₄	Semiconductor	20-2000 ppm
MA-Freon	MA-4-20xx-D-x	Freon *	HFCKW, HFKW	Semiconductor	0-300/2000 ppm ¹

OPTIONS

Description

Options	Item number	Description
MA-Plastic A	MA-x-xxxx-A-x	Plastic housing 96*130*56mm (w*h*d), IP65, instead of "D"
MA-Duct	MA-x-xxxx-B-x	Duct mounting set, instead of "D"
MA-Plastic D	MA-x-xxxx-D-x	Plastic housing 96*65*56mm (w*h*d), IP43
MA-Plastic DI	MA-x-xxxx-DI-x	Plastic housing 96*65*56mm (w*h*d), IP54, instead of "D"
MA-Plastic F	MA-x-xxxx-F-x	Plastic housing 87*45,5mm (Ø*h), IP43, instead of "D"
MA-Plastic FI	MA-x-xxxx-FI-x	Plastic housing 87*45,5mm (Ø*h), IP44, instead of "D"
MA-Stainless	MA-x-xxxx-5-x	Stainless steel housing, instead of "D"
OT	OT-01	Tool for opening the stainless steel housing

¹ please specify at order

² others on request

* please see page 24/25 and corresponding datasheet



Features

- Power input 24 VDC
- μ-Gard MA-Transmitters with signal output 4-20 mA / 2-10 V
- Plastic housing "D" 94*65*57 mm, IP43
- Calibration with potentiometer
- Certified calibration

DESCRIPTION

Analog transmitter for the continuous monitoring of gases and vapours in the ambient air. Used in garages, chiller rooms, heating systems and many more, the μ-Gard MA series analog transmitter is a reliable gas detector.



PolyGard® Analog Sensor Series



Short term	Item number	Type of gas	Formula	Sensor type	Range ²
ADT-NH3	ADT-23-1120-A-00000200x	Ammonia	NH ₃	El-chem.	0-300/1000 ppm ¹
ADT-NH3 Cold	ADT-23-1125-A-00100200x	Ammonia till -40°C	NH ₃	El-chem.	0-300/1000 ppm ¹
ADT-5-NH3	ADT-53-1120-A-001002003	Ammonia	NH ₃	El-chem.	0-5000 ppm
ADT-5-C2H4	ADT-53-1189-A-000002001	Ethylene	C ₂ H ₄	El-chem.	0-10 ppm
ADT-O2	ADT-93-1195-A-000002001	Oxygen	O ₂	El-chem.	0-25 vol%
ADT-CO2	ADT-D3-1164-A-000002007	Carbon dioxide	CO ₂	Infrared	0-5 vol%
ADT-D-EX	ADT-D3-34xx-A-000002001	Combustible*		Infrared	0-100 %LEL
ADT-D-C2H4	ADT-D3-1189-A-000002001	Ethylene	C ₂ H ₄	Infrared	0-2000 ppm
ADT-D-R	ADT-D3-20XX-A-000002002	Freon*	HFCKW, HFKW	Infrared	0-2000 ppm
ADT-O-EX >UL<	ADT-03-34xx-A-000002001	Combustible*		Pellistor	0-100 %LEL
ADT-2-EX	ADT-23-34xx-A-000002001	Combustible*		Pellistor	0-100 %LEL
ADT-3-NH3	ADT-33-1120-A-000002001	Ammonia	NH ₃	Semiconductor	0-300 ppm
ADT-4-EX	ADT-43-3HXX-A-000002001	Combustible*		Semiconductor	0-50/100 %LEL
ADT-4-C2H4	ADT-43-1189-A-000002001	Ethylene	C ₂ H ₄	Semiconductor	20-2000 ppm
ADT-4-R	ADT-43-20xx-A-00000200x	Freon*	HFCKW, HFKW	Semiconductor	0-300/2000 ppm ¹

Features

- Power input 24 VDC
- PolyGard ADT-Transmitters with signal output (0)4-20 mA (0)2-10 V
- Plastic housing "A" 96*130*56 mm (w*h*d), IP65
- Certified calibration

DESCRIPTION

The Analog transmitter including digital measurement value processing and temperature compensation is used for the continuous monitoring of the ambient air to detect gas concentrations. Due to the standard analog signal outputs the ADT transmitter is compatible to the PolyGard series MGC by MSR-E as well as to any other electronic control or automation systems.

OPTIONS

		Description
ADT-Plastic	ADT-xx-xxxx-A-xxxxxxxxx	Plastic housing 96*130*56 mm (w*h*d), IP65
ADT-Duct	ADT-xx-xxxx-B-xxxxxxxxx	Duct mounting set, instead of "A"
ADT-Metal	ADT-xx-xxxx-2-xxxxxxxxx	Metal housing 142*142*63 mm (w*h*d), instead of "A"
ADT-Stainless	ADT-xx-xxxx-5-xxxxxxxxx	Stainless steel housing, instead of "A", not available for IR-Sensors
OT	OT-01	Tool for opening the stainless steel housing
ADT-Rel	ADT-x3-xxxx-x-1xxxxx0x	2 relay outputs pot.free 30 V 0,5 A
ADT-Buz	ADT-x3-xxxx-A-1lxxxxxx	Internal buzzer, needs 1 relay output, only in consumption with ADT-Rel available
ADT-Hot	ADT-x3-xxxx-x-xx1xxxx0x	Heating
ADT-LCD	ADT-x3-xxxx-A-xxxxxx1xx	LCD display, not available for housing "5"
ADT-LED	ADT-x3-xxxx-A-xxxxxx2xx	LED display, not available for housing "5"
ADT-CO2-2000	ADT-D3-1164-x-xxxxxxx4	Change of the measuring range to 2000 ppm
ADT-CO2-5000	ADT-D3-1164-x-xxxxxxx5	Change of the measuring range to 5000 ppm
ADT-CO2-20%	ADT-D3-1164-x-xxxxxxx8	Change of the measuring range to 20 Vol%

¹ please specify at order

² others on request

* please see page 24/25 and corresponding datasheet

PolyGard® Digital Sensor Series

Short term	Item number	Type of gas	Formula	Sensor type	Range ²
ADT-NH3-Tool	ADT-23-1120-A-00001100x	Ammonia	NH ₃	El-chem.	0-300/1000 ppm ¹
ADT-NH3-Tool Cold	ADT-23-1125-A-00101100x	Ammonia till -40°C	NH ₃	El-chem.	0-300/1000 ppm ¹
ADT-5-NH3-Tool	ADT-53-1120-A-001011003	Ammonia	NH ₃	El-chem.	0-5000 ppm
ADT-5-C2H4-Tool	ADT-53-1189-A-000011001	Ethylene	C ₂ H ₄	El-chem.	0-10 ppm
ADT-O2-Tool	ADT-93-1195-A-000011001	Oxygen	O ₂	El-chem.	0-25 vol%
ADT-CO2-Tool	ADT-D3-1164-A-000012007	Carbon dioxide	CO ₂	Infrared	0-5 vol%
ADT-D-EX-Tool	ADT-D3-34xx-A-000012001	Combustible *		Infrared	0-100 %LEL
ADT-D-C2H4-Tool	ADT-D3-1189-A-000012001	Ethylene	C ₂ H ₄	Infrared	0-2000 ppm
ADT-D-R-Tool	ADT-D3-20xx-A-000012002	Freon*	HFCKW, HFKW	Infrared	0-2000 ppm
ADT-O-EX-Tool >UL<	ADT-03-34xx-A-000011001	Combustible *		Pellistor	0-100 %LEL
ADT-2-EX-Tool	ADT-23-34xx-A-000011001	Combustible *		Pellistor	0-100 %LEL
ADT-3-NH3-Tool	ADT-33-1120-A-000011001	Ammonia	NH ₃	Semiconductor	0-300 ppm
ADT-4-EX-Tool	ADT-43-3Hxx-A-000011001	Combustible *		Semiconductor	0-50/100 %LEL
ADT-4-C2H4-Tool	ADT-43-1189-A-000011001	Ethylene	C ₂ H ₄	Semiconductor	20-2000 ppm
ADT-4-R-Tool	ADT-43-20xx-A-00001100x	Freon *	HFCKW, HFKW	Semiconductor	0-300/2000 ppm ¹

OPTIONS

		Description
ADT-Plastic	ADT-xx-xxx-A-xxxxxxx	Plastic housing 96*130*56 mm (w*h*d), IP65
ADT-Duct	ADT-xx-xxx-B-xxxxxxx	Duct mounting set, instead of "A"
ADT-Metal	ADT-xx-xxx-2-xxxxxxx	Metal housing 142*142*63 mm (w*h*d), instead of "A"
ADT-Stainless	ADT-xx-xxx-5-xxxxxxx	Stainless steel housing, instead of "A", not available for IR-Sensors
OT	OT-01	Tool for opening the stainless steel housing
ADT-Rel	ADT-x3-xxx-x-1xxxxx0x	2 relay outputs pot.free 30 V 0.5 A
ADT-Buz	ADT-x3-xxx-A-1xxxxxx	Internal buzzer, needs 1 relay output, only in consumption with ADT-Rel available
ADT-Hot	ADT-x3-xxx-x-xx1xxxxx	Heating
ADT-Mod	ADT-x3-xxx-x-xxxx2xxxx	RS 485 ModBus output
ADT-Bac	ADT-x3-xxx-x-xxxx4xxxx	RS 485 BacNet MS/TP output
ADT-Manu	ADT-x3-xxx-A-xxxxx4xxx	Manual calibration and addressing, required at Modbus version
ADT-LCD	ADT-x3-xxx-A-xxxxx2lxx	LCD display, not available for housing "5", only available with manual calibration
ADT-LED	ADT-x3-xxx-A-xxxxx22xx	LED display, not available for housing "5", only available with manual calibration
ADT-CO2-2000	ADT-D3-1164-x-xxxxxxx4	Change of the measuring range to 2000 ppm
ADT-CO2-5000	ADT-D3-1164-x-xxxxxxx5	Change of the measuring range to 5000 ppm
ADT-CO2-20%	ADT-D3-1164-x-xxxxxxx8	Change of the measuring range to 20 Vol%

¹ please specify at order

² others on request

* please see page 24/25 and corresponding datasheet



Features

- Power input 24 VDC
- PolyGard ADT-Transmitters with signal output (0)4-20 mA
0(2)-10 V, RS485
Calibration⁴ and addressing with tool or manual
- Plastic housing "A" 96*130*56 mm (w*h*d), IP65
- Certified calibration

DESCRIPTION

Digital/Analog transmitter including digital measurement value processing and temperature compensation is used for the continuous monitoring of the ambient air to detect gas concentrations. Due to the standard signal outputs the ADT transmitter is compatible to the PolyGard series DGC by MSR-Electronic, as well as to any other electronic control or automation systems.



Short term	Item number ¹	Type of gas	Formula	Range	Sensor type
XT-I-AM1	XT-21-112x-EDO-001	Ammonia	NH ₃	0-200 / 1000 ppm ¹	El-chem.
XT-I-O2	XT-21-1195-EDO-001	Oxygen	O ₂	0-25 vol%	El-chem.
XT-I-X1	XT-21-34xx-PDO-001	Combustible *		0-100 %LEL	Pellistor
XT-I-X2	XT-21-34xx-PDO-001	Combustible *		0-100 %LEL	Pellistor
XT-I-CO2	XT-A1-116x-IDO-001	Carbon dioxide	CO ₂	0-2/5/30 vol% ¹	Infrared
XT-IA-ME	XT-A1-3400-IDO-001	Methane ³	CH ₄	0-100 %LEL	Infrared

Features

- Power input 24 VDC
- PolyXeta XT-Transmitters with signal output 4-20 mA
- Metal housing Zone2
106 x 160 x 62 mm (w*h*d). IP55
- Calibration with XTS Tool
- Certified calibration

DESCRIPTION

The PolyXeta gas transmitter is used in industrial ranges like oil/gas, petrochemical industry, power plants, mining etc. in Ex Zone 1 and 2. The PolyXeta transmitter is also suitable for commercial ranges like gas transfer stations etc. Due to the 4 to 20 mA analog output signal the transmitter is compatible to the PolyGard series DGC by MSR-E, as well as to any other electronic control or automation systems.

OPTIONS

		Description
XTIDIS	XT-xx-xxxx-xDL-001	with Display
XTS/CKD	XTS/CKD	Calibration Tool (plugable) ²
XTS/CSW	XTS/CSW	Calibration Software ³
XTS/IDI	XTS/IDI	RS485-Interface
XTS.Gland	XTS.Gland	Cable gland for Zone 1
XTS1Rel	XTS1Rel	with 1 Relay
XTS3Rel	XTS3Rel	with 3 Relays ²
XTS3Rel/50	XTS3Rel/50	with 3 Relays/50
X.ZMCAP	X.ZMCAP	Calibration Adapter

- ¹ please specify at order
² others on request
³ not available with display
* please see page 24/25 and corresponding datasheet

PolyXeta® ATEX Zone2 Sensor

Short term	Item number	Type of gas	Formula	Range	Sensor type
XT-2-AM1	XT-2I-1125-ENO-001	Ammonia	NH ₃	0-200 ppm	El-chem.
XT-2-AM2	XT-2I-1126-ENO-001	Ammonia	NH ₃	0-1000 ppm	El-chem.
XT-2-EL	XT-2I-1190-ENO-001	Ethylene	C ₂ H ₄	0-200 ppm	El-chem.
XT-2-O2	XT-2I-1195-ENO-001	Oxygen	O ₂	0-25 vol%	El-chem.
XT-2-CO21	XT-AI-1160-INO-001	Carbon dioxide	CO ₂	0-2 vol%	Infrared
XT-2-CO22	XT-AI-1161-INO-002	Carbon dioxide	CO ₂	0-5 vol%	Infrared
XT-2-CO23	XT-AI-1161-INO-003	Carbon dioxide	CO ₂	0-30 vol%	Infrared
XT-2-CO24	XT-AI-1161-INO-004	Carbon dioxide	CO ₂	0-5000 ppm	Infrared
XT-2A-ME	XT-AI-3400-INO-001	Methane ²	CH ₄	0-100 %LEL	Infrared
XT-2-ME	XT-2I-3400-PNO-001	Methane	CH ₄	0-100 %LEL	Pellistor
XT-2-BU	XT-2I-3460-PNO-001	n-Butane	C ₂ H ₁₀	0-100 %LEL	Pellistor
XT-2-PR	XT-2I-3480-PNO-001	Propane	C ₃ H ₈	0-100 %LEL	Pellistor

OPTIONS

		Description
XT2DIS	XT-xx-xxxx-xNL-001	with Display
XTS/CKD	XTS/CKD	Calibration Tool (plugable) ¹
XTS/CSW	XTS/CSW	Calibration Software
XTS/IDI	XTS/IDI	RS485-Interface
XTSIRel	XTSIRel	with 1 Relay
XTS3Rel	XTS3Rel	with 3 Relays ¹
XTS3Rel/50	XTS3Rel/50	with 3 Relays/50
X.ZMCAP	X.ZMCAP	Calibration Adapter

¹ not available with display

* please see page 24/25 and corresponding datasheet



Features

- Power input 24 VDC
- PolyXeta XT-Transmitters with signal output 4-20 mA
- Metal housing Zone1
105 x 200 x 90 mm (w*h*d), IP65
- Calibration with XTS Tool
- Certified calibration
- without cable gland

DESCRIPTION

The PolyXeta gas transmitter is used in industrial ranges like oil/gas, petrochemical industry, power plants, mining etc. in Ex Zone 2. The PolyXeta transmitter is also suitable for commercial ranges like gas transfer stations etc. Due to the 4 to 20 mA analog output signal the transmitter is compatible to the PolyGard series MGC and DGC by MSR-E, as well as to any other electronic control or automation systems.



Short term	Item number	Type of gas	Formula	Range ²	Sensor type
SPC-NH3	SPC-23-1120-C-010000011	Ammonia	NH ₃	0-300/1000 ppm ¹	El-chem.
SPC-5-C2H4	SPC-53-1189-C-010000011	Ethylene	C ₂ H ₄	0-10 ppm	El-chem.
SPC-O2	SPC-93-1195-C-010000011	Oxygen	O ₂	0-25 vol%	El-chem.
SPC-CO2	SPC-D3-1164-C-010000011	Carbon dioxide	CO ₂	0-5 vol%	Infrared
SPC-D-EX	SPC-D3-34xx-C-010000011	Combustible *		0-100 %LEL	Infrared
SPC-D-C2H4	SPC-D3-1189-C-010000011	Ethylene	C ₂ H ₄	0-2000 ppm	Infrared
SPC-D-R	SPC-D3-20xx-C-010000011	Freon *	HFCKW, HFKW	0-2000 ppm	Infrared
SPC-0-EX >UL<	SPC-03-34xx-C-010000011	Combustible *		0-100 %LEL	Pellistor
SPC-2-EX	SPC-23-34xx-C-010000011	Combustible *		0-100 %LEL	Pellistor
SPC-3-NH3	SPC-33-1120-C-010000011	Ammonia	NH ₃	0-300 ppm	Semiconductor
SPC-4-EX	SPC-43-3Hxx-C-010000011	Combustible *		0-50/100 %LEL	Semiconductor
SPC-4-C2H4	SPC-43-1189-C-010000011	Ethylene	C ₂ H ₄	20-2000 ppm	Semiconductor
SPC-4-R-Freon	SPC-43-20xx-C-010000011	Freon *	HFCKW, HFKW	0-300/2000 ppm ¹	Semiconductor

Features

- Power input 24 VDC/AC
- SPC-X3 with 2 relay output pot.free 30 V 0.5 A and 1 open-collector output
- Plastic housing 130*130*75 mm (w*h*d), IP65
- Internal buzzer, additional analog input 4-20 mA
- Certified calibration

DESCRIPTION

Gas measuring and monitoring controller based on state-of-the-art micro technology with integrated sensor for continuous monitoring of the ambient air for detecting gases and vapours. The SPC-X3 is provided an input for one external analog transmitter. An audible alarm is included to protect persons from being poisoned.

OPTIONS

		Description
SPC-Duct	SPC-x3-xxxx-B-xxxxxxxxx	Duct mounting set, additional charge
SPC-Power	SPC-x3-xxxx-C-1xxxxxxxx	Power supply 230 VAC ⁴
OT	OT-01	Tool for opening the stainless steel housing
SPC-1-Rel	SPC-x3-xxxx-E-1xx1xxxxx	1 power relay for SPC-x3 pot.free 230 V 5 A
SPC-2-Rel	SPC-x3-xxxx-E-1xx2xxxxx	2 power relays for SPC-x3 pot.free 230 V 5 A
SPC-3-Rel	SPC-x3-xxxx-E-1xx3xxxxx	3 power relays for SPC-x3 pot.free 230 V 5 A
SPC-Blink	SPC-x3-xxxx-x-3xxxxxxxx	LED-Flashlight (needs 1 open collector output)
SPC-USV	SPC-x3-xxxx-E-2xxxxxxxx	Battery pack for SPC X3, Housing 130*130*99 mm (w*h*d)
SPC-Hot	SPC-x3-xxxx-x-xx1xxxxxx	Heating
SPC-CO2-2000	SPC-D3-1164-x-xxxxxxx4x	Change of the measuring range to 2000 ppm
SPC-CO2-5000	SPC-D3-1164-x-xxxxxxx5x	Change of the measuring range to 5000 ppm
SPC-CO2-20%	SPC-D3-1164-x-xxxxxxx8x	Change of the measuring range to 20 Vol%
SPC-Menü	SPC-x3-xxxx-x-xxxxxxxX	Last position of the ordering number: Menu language

SPC-Heavy

SPC-Housing	SPC-x3-xxxx-E-xxxxxxxxx	Change to bigger housing "E"
SPC-Flash ³	SPC-x3-xxxx-C-x4xxxxxxxx	Flashlight 24 VDC 5W, available in green, yellow, red
SPC-Horn ⁴	SPC-x3-xxxx-C-x5xxxxxxxx	Warning horn, up to 101 dB(A)

¹ please specify at order

² others on request

³ please specify at order, max. 2 pcs. available, changes relay output from pot. free to 24 VDC, max. load 0.3A, or parallel alarm to 1 power relay

⁴ uses open collector output, or parallel alarm to 1 power relay

* please see page 24/25 and corresponding datasheet

PolyGard® Portable Logger

Short term	Item number	Type of gas	Formula	Range ²	Sensor type
ADL-NH3	ADL-2I-1120-E-x10I	Ammonia	NH ₃	0-300/1000 ppm ¹	El-chem.
ADL-5-C2H4	ADL-5I-1189-E-3I0I	Ethylene	C ₂ H ₄	0-10 ppm	El-chem.
ADL-O2	ADL-9I-1195-E-KI0I	Oxygen	O ₂	0-25 vol%	El-chem.
ADL-CO2	ADL-DI-1164-H-I30I	Carbon dioxide	CO ₂	0-5 vol%	Infrared
ADL-D-EX	ADL-DI-34xx-H-M30I	Combustible *		0-100 %LEL	Infrared
ADL-D-C2H4	ADL-DI-1189-H-F30I	Ethylene	C ₂ H ₄	0-2000 ppm	Infrared
ADL-D-R	ADL-DI-20xx-H-F30I	Freon *	HFCKW, HFKW	0-2000 ppm	Infrared
ADL-2-EX	ADL-2I-34xx-E-M20I	Combustible *		0-100 %LEL	Pellistor
ADL-3-NH3	ADL-3I-1120-E-B20I	Ammonia	NH ₃	0-300 ppm	Semiconductor
ADL-4-EX	ADL-4I-3Hxx-E-T20I	Combustible *		0-50/100 %LEL	Semiconductor
ADL-4-C2H4	ADL-4I-1189-E-F30I	Ethylene	C ₂ H ₄	20-2000 ppm	Semiconductor
ADL-4-R	ADL-4I-20xx-E-x20I	Freon *	HFCKW, HFKW	0-300/2000 ppm ¹	Semiconductor

OPTIONS

		Description
ADL-Clip	ADL-xI-xxxx-x-xx2x	Fastening eye
ADL-ND	ADL-xI-xxxx-x-xxx2	Without display
ADL-Accu	ADL-xI-Accu	High power accumulator for longer running time
ADL-Charger	ADL-xI-Charger	Charger for accumulator
ADL-Soft	ADL-xI-Soft	Software and USB adapter

¹ please specify at order

² others on request

* please see page 24/25 and corresponding datasheet

PolyGard® Portable CO₂



Short term	Item number	Type of gas	Range
PT-B	PT-B-82-1160-xxxxx	Carbon dioxide	0-2000 ppm, 0-60 °C
PT-C	PT-C-82-1160-xxxxx	Carbon dioxide	0-3000 ppm, -10 - 60 °C, 0-95 %RH

OPTIONS

		Description
PT-Soft	PT-X-82-1160-1lxxx	Software and interface cable RS232
PT-Plug	PT-X-82-1160-xxlxx	Plug Power supply 220 V
PT-Cal	PT-C-82-1160-xxxxl	Calibration solution for air humidity measurement 33 % + 75 %RH



Features

- Suitable for all gases
- Logging interval 1min -
- Data storage for 16000 values
- Integrated battery's run-time: depends on sensor type
- Certified calibration

DESCRIPTION

Portable Logger for the continuous monitoring of gases and vapours in the ambient air. Used in garages, chiller rooms, heating systems and many more, the ADL portable series logger is a reliable gas detector which stores its detected values. The ADL provides an interface to connect to any PC / Laptop to download these values for further storage and documentation.



PolyGard[®] Flow Transmitter



Short term	Item number	Type of gas	Formula	Range ²	Sensor type ⁴
FT-C2H4 Tox	FT-D3-3405-E-00000000M	Ethylene	C ₂ H ₄	0-2000 ppm	Infrared
FT-C2H4 EX	FT-D3-1189-E-00000000F	Ethylene	C ₂ H ₄	0-100 %LEL	Infrared
FT-CO2-1	FT-D3-3410-E-00000000M	Carbon dioxide	CO ₂	0-5000 ppm	Infrared
FT-CO2-2	FT-D3-1164-E-00000000H	Carbon dioxide	CO ₂	0-5 vol%	Infrared
FT-CO2-3	FT-D3-1164-E-00000000I	Carbon dioxide	CO ₂	0-20 vol%	Infrared
FT-CO2-4	FT-D3-1164-E-00000000J	Carbon dioxide	CO ₂	0-100 vol%	Infrared
FT-CH4-1	FT-D3-1164-E-00000000L	Methane	CH ₄	0-100 %LEL	Infrared
FT-CH4-2	FT-D3-1110-E-00000000G	Methane	CH ₄	0-100 vol%	Infrared
FT-C3H8-1	FT-D3-1110-E-00000000K	Propane	C ₃ H ₈	0-100 %LEL	Infrared
FT-C3H8-2	FT-D3-1110-E-00000000L	Propane	C ₃ H ₈	0-100 vol%	Infrared
FT-C4H10-1	FT-D3-3400-E-00000000M	n-Butane	C ₄ H ₁₀	0-100 %LEL	Infrared
FT-C4H10-2	FT-D3-3400-E-00000000L	n-Butane	C ₄ H ₁₀	0-100 vol%	Infrared
FT-R134a	FT-D3-3480-E-00000000M	Freon	R134a	0-2000 ppm	Infrared
FT-R123	FT-D3-3480-E-00000000L	Freon	R123	0-2000 ppm	Infrared
FT-R125	FT-D3-3460-E-00000000M	Freon	R125	0-2000 ppm	Infrared
FT-R404a	FT-D3-3460-E-00000000L	Freon	R404a	0-2000 ppm	Infrared
FT-R22	FT-D3-1184-E-000000006	Freon	R22	0-2000 ppm	Infrared

Features

- Power input 24 VDC
- PolyGard FT-Transmitters with signal output (0)4-20 mA / 0(2)-10 V
- Plastic housing "E" 130*130*99 mm (w*h*d). IP65
- Certified calibration

DESCRIPTION

The Flow Transmitter series FT is used anywhere the detector cannot be mounted at the site due environmental conditions. Through a tube and a pump the Digital/Analog transmitter is connected to the site for the continuous monitoring of the air to detect gas concentrations. Due to the standard signal outputs the FT transmitter is compatible to the PolyGard series MGC and DGC by MSR-E, as well as to any other electronic control or automation systems.

OPTIONS

		Description
FT-Rel	FT-x3-xxxx-E-1xxxxxx0x	2 relay outputs pot.free 30 V 0.5 A
FT-2-Rel	FT-x3-xxxx-E-2xxxxxx0x	2 relay outputs pot.free 230 V 5 A
FT-Buz	FT-x3-xxxx-E-x1xxxxxx	Internal buzzer
FT-Hot	FT-x3-xxxx-E-xx1xxxxxx	Heating
FT-LCD	FT-x3-xxxx-E-xxxxxx1xx	LCD display
FT-LED	FT-x3-xxxx-E-xxxxxx2xx	LED display
FT-Pump	FT-Pump	Pump for measuring gas, with constant flow
FT-Filter	FT-Filter	Filter for measuring gas
FT-Housing	FT-Housing	EX-proof housing for Zone 1

2 others on request

4 other sensing elements on request

* please see page 24/25 and corresponding datasheet

PolyGard® CellarAlarm System

Short term	Item number	Description
CAC-CO2 24	CAC-D3-1164-A-130000007	CO ₂ - Transmitter Stand Alone 24 V ¹
CAC-CO2 230	CAC-D3-1164-C-130100007	CO ₂ - Transmitter Stand Alone 230 V ¹
RDP	RDP-D3-000	Alarm module
CAC-3-24	CAC-03-02-02-C-030015011	CellarAlarm Controller 24 V ¹
CAC-3-230	CAC-03-02-02-C-130015011	CellarAlarm Controller 230 V ¹
ADT-CO2 CAC	ADT-D3-1164-030000007	CO ₂ - Transmitter ¹
MA-O2-A	MA-9-1195-A-K	O ₂ - Transmitter

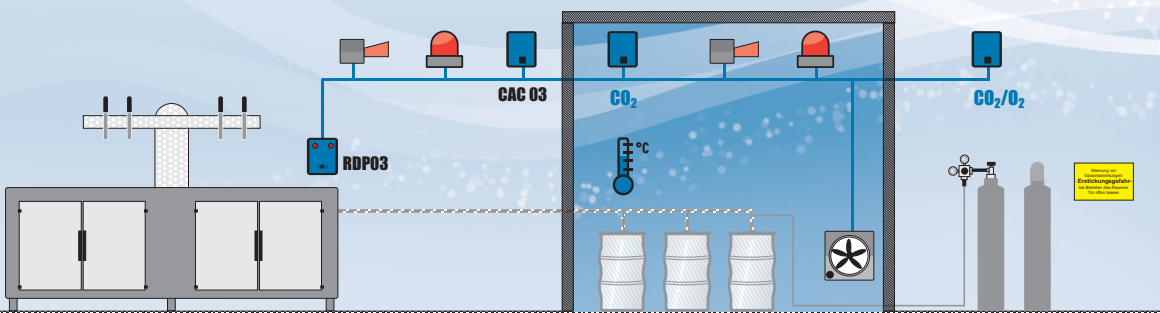
OPTIONS

CAC-Hot	CAC-x3	Heating
CAC-1-Rel	CAC-x3-xxxx-E-1xx1xxxxx	1 power relay for CAC-x3 pot.free 230 V 5 A
CAC-2-Rel	CAC-x3-xxxx-E-1xx2xxxxx	2 power relays for CAC-x3 pot.free 230 V 5 A
CaC-3-Rel	CAC-x3-xxxx-E-1xx3xxxxx	3 power relays for CAC-x3 pot.free 230 V 5 A
CAC-USV	CAC-x3-xxxx-E-2xxxxxxx	Battery pack for CAC-Controller 230 V
CAC-Menü	CAC-x3-xxxx-x-xxxxxxx	Menu language ²

¹ plastic housing IP65, internal buzzer and flashlight

² please specify at order

SAMPLE



Whether in pubs, restaurants, fermenting cellars, breweries, wineries, bottling plants or even in storage facilities and production halls with CO₂ extinguishing devices, everywhere CO₂ bottles, gas lines and tanks are employed, PolyGard CO₂ / O₂ sensors can be used for monitoring the air quality. Whether for the compliance with the MAC values or for revealing leakages, MSR transmitters always detect reliably harmful concentrations of gases and vapours in the ambient air.



Features

- CAC-Controller with 2 relay outputs pot.free 30 V 0.5 A
- CAC-Transmitter Stand Alone with 2 relay outputs pot.free 30 V 0.5 A
- CAC-Transmitter with 4-20 mA analog output
- RDP-Alarm module for CAC-Controller and CAC-Transmitter Stand Alone
- Certified calibration

DESCRIPTION

PolyGard CO₂ / O₂ sensors can be used for monitoring the air quality in Cellar Systems. The transmitters are used for the continuous monitoring of CO₂ / O₂ in the ambient air. In combination with the RDP or CAC-System from MSR the persons are warned from getting poisoned by leaking bottles or processes even before entering the room.



PolyGard[®] Analog Controller Series MGC-03



Short term	Item number	Description
MGC-3-24	MGC-03-02-02-C-01000x011	MGC-03 Controller 24 V
MGC-3-230	MGC-03-02-02-C-11000x011	MGC-03 Controller 230 V

OPTIONS

MGC-1-Rel	MGC-03-xxxx-E-1xx1xxxxx	1 power relay for MGC-x3 pot.free 230 V 5 A
MGC-2-Rel	MGC-03-xxxx-E-1xx2xxxxx	2 power relays for MGC-x3 pot.free 230V 5 A
MGC-3-Rel	MGC-03-xxxx-E-1xx3xxxxx	3 power relays for MGC-x3 pot.free 230 V 5 A
MGC-3-USV	MGC-03-02-02-E-2xxxxxxx	Battery pack for measuring system
MGC-Blink	MGC-03-02-02-x-x2xxxxxxx	Flashlight LED
MGC-3-Hot	MGC-03-02-02-x-xx1xxxxxx	Heating
MGC-3-Power	MGC-03-xx-xx-x-xxxxxx1xx	Power fail flashing light
MGC-Menü	MGC-03-02-02-x-xxxxxxx	Menu language ¹

MGC-Heavy

MGC-Housing	MGC-x3-xxxx-C-xxxxxxx	Change to bigger housing "C"
MGC-Flash ³	MGC-x3-xxxx-C-x4xxxxxxx	Flashlight 24 VDC 5W, available in green, yellow, red
MGC-Horn ⁴	MGC-x3-xxxx-C-x5xxxxxxx	Warning horn, up to 101 dB(A)

Features

- Power input 24 V AC/DC or 230 V AC
- 2 analog inputs, 2 relay outputs
- pot.free 30 V 0.5 A and 1 open-collector output
- Plastic housing 130*130*75 mm (w*h*d), IP65
- Internal buzzer

DESCRIPTION

The MGC-03 is equipped with two analog inputs for the connection of external transmitters including detection of wire break and short-circuits. Up to four alarm thresholds per input are free programmable. Two alarm relays and two open collector outputs are available for the alarm messages. Configuration and operation are possible via the logical, simple system menu structure without specific programming knowledge.

- 1 please specify at order
 - 3 please specify at order, max. 2 pcs. available, changes relay output from pot. free to 24 VDC, max. load 0.3A, or parallel alarm to 1 power relay
 - 4 uses open collector output, or parallel alarm to 1 power relay
- * please see corresponding datasheet

PolyGard® Analog Controller Series

DGC-05

Short term	Item number	Housing	MP /Relay	MP/Relay max. ¹
MGC-XS 1.1A	DGC-05-16-1-0-0-1-000000-XX	298*260*140 mm (w*h*d)	4 MP 5 relays	4 MP 5 relays
MGC-S 4.5A	DGC-05-16-1-0-0-2-000000-XX	298*420*140 mm (w*h*d)	4 MP 5 relays	12 MP 15 relays
MGC-M 6.5A	DGC-05-16-1-0-0-3-000000-XX	298*570*140 mm (w*h*d)	4 MP 5 relays	20 MP 25 relays
MGC-L 6.5A	DGC-05-16-1-0-0-4-000000-XX	410*655*140 mm (w*h*d)	4 MP 5 relays	32 MP 30 relays

MODULES

		Description	
GC-04	GC-05-000000-00	Gas Controller Module	4 MP 5 relays
GC-04-Door	GC-05-002000-00	Gas Controller Module for door mounting	4 MP 5 relays
MGC-EP-4-5	EP-05-0100	Expansion Module Address 1-6	4 MP 5 relays
MGC-EP-4-0-1	EP-05-0200	Expansion Module Address 9-16	4 MP
MGC-EP-4-0-2	EP-05-0300	Expansion Module Address 17-23	4 MP
LON-Koppler	MGC-04-RS-485-LON	RS485/LON-Coupler	
Bac-Koppler	MGC-04-RS-485-Bac	RS485/BacNet	
Mod-Koppler	MGC-04-RS-485-ModBus	RS485/ModBus	
Mod- Output	DGC-05-XX-X-X-X-X-XXXXXX1-XX	RS485/ModBus output	
GPRS-Module	DGC-04-ModBus-GPRS	ModBus/GPRS-Modul without SIM-Card. incl. Mod-Koppler	
Koppler-Cases	DGC-xxx-05-xlx	Enclosure for coupler with 230 V power supply	

OPTIONS

MGC-USV1	DGC-05-XX-3-X-X-X-XXXXXX-XX	Emergency power supply for MGC-XS and MGC-S
MGC-USV2	DGC-05-XX-4-X-X-X-XXXXXX-XX	Emergency power supply for MGC-M and MGC-L
MGC-Power	DGC-05-XX-X-X-X-X-1XXXXX-XX	Power fail flashing light
MGC-Buzzer	DGC-05-XX-X-X-X-X-X1XXXX-XX	Integrated buzzer
MGC-Menü		Menu language ²
MGC-Lock	DGC-05-XX-X-X-X-X-XXX1XX-XX	Lock incl. installation
MGC-Metal	DGC-05-XX-X-X-X-8-XXXXXX-XX	Metal housing instead of plastic housing for Controller
MGC-UL	DGC-05-XX-X-X-X-X-X2XXXX-XX	Housing with UL certification
MGC-Relay	DGC-Relay	Relay to double up 1 Alarm output

Door Entrance Module

DEM-X3	DEM-X3-A-100	Door Entrance Module with Display
DEM-X3 B	DEM-X3-A-110	Door Entrance Module with Display and Buzzer
DEM-X3 SF	DEM-X3-A-101	Door Entrance Module with Display, Buzzer and red Flashlight

¹ extended with EP modul

² changeable by customer



Features

- Analog controller for 4-20 mA transmitters
- up to 96 analog transmitters
- up to 30 relay outputs, up to 12 analog outputs

DESCRIPTION

The Gas Controller series DGC-05 can monitor up to 96 analog gas transmitters with 4-20 mA signal. Five alarm thresholds are adjustable to each channel. For activating the alarm up to 30 relays with changeover contacts are available. The free adjustable parameters and alarm threshold enable a very flexible use in the gas measuring technique. Simple and comfortable commissioning is granted by the factory adjusted parameters. The configuration, parameter settings and operation is easy to do without programming knowledge.



PolyGard® Digital Controller Series DGC-05



Short term	Item number	Housing	MP / Relay	Relay max. ¹
DGC-XSD 4.5A	DGC-05-32-1-1-0-1-000000-XX	298*260*140 mm (w*h*d)	24 BUS 5 relays	5 relays
DGC-XSDA 4.5A	DGC-05-32-1-1-0-1-000000-XX	298*260*140 mm (w*h*d)	12 pairs 5 relays	5 relays
DGC-SD 6.5A	DGC-05-48-2-1-0-2-000000-XX	298*420*140 mm (w*h*d)	48 BUS 5 relays	15 relays
DGC-SDA 6.5A	DGC-05-48-2-1-0-2-000000-XX	298*420*140 mm (w*h*d)	24 pairs 5 relays	15 relays
DGC-MD 6.5A	DGC-05-48-2-1-0-3-000000-XX	298*570*140 mm (w*h*d)	48 BUS 5 relays	25 relays
DGC-MDA 6.5A	DGC-05-48-2-1-0-3-000000-XX	298*570*140 mm (w*h*d)	48 pairs 5 relays	25 relays
DGC-LD 6.5A	DGC-05-98-1-1-0-4-000000-XX	410*655*140 mm (w*h*d)	98 BUS 5 relays	30 relays
DGC-LDA 6.5A	DGC-05-98-1-1-0-4-000000-XX	410*655*140 mm (w*h*d)	48 pairs 5 relays	30 relays

MODULES

		Description	MP/Relay
GC-05D	GC-05-000000-00	Gas Controller Module	98 BUS 5 relays
GC-05DA	GC-05-000000-00	Gas Controller Module	48 pairs 5 relays
GC-05D-Door	GC-05-002000-00	Gas Controller Module for door mounting	98 BUS 5 relays
GC-05DA-Door	GC-05-002000-00	Gas Controller Module for door mounting	48 pairs 5 relays
DGC-EP-4-5	EP-05-0100	Expansion Module Address 1-6	4 AI 5 relays
DGC-EP-4-0-1	EP-05-0200	Expansion Module Address 9-16	4 AI
DGC-EP-4-0-1	EP-05-0300	Expansion Module Address 17-23	4 AI
RCP-Wall	DGC-RCP-05-01-00000	Remote display panel DGC 05 "in wall"	
RCP-On Wall	DGC-RCP-05-02-00000	Remote display panel DGC 05 "on wall"	
RCP-Rack	DGC-RCP-05-03-00001	Remote display panel DGC 05 "DIN-Rack"	
CON	DGC-05-XX-X-1-X-X-XXXXXX-XX	BUS connector module - required for first Bus-loop	
REP	DGC-05-XX-X-2-X-X-XXXXXX-XX	incl. 1 piece Repeater - required for each additional Bus-loop	
REP-D 3	DGC-15-XX-X-2-X-X-XXXXXX-XX	incl. 1 Pcs. Repeater for 3-Wire Bus-Systems. for each Loop 1 Pcs.	
REP 24	DGC-REP-05-100	Repeater with 24 V (plastic housing)	
REP 230	DGC-REP-05-010	Repeater with 230 V (plastic housing)	
Mod- Output	DGC-05-XX-X-X-X-X-XXXXX1-XX	RS485/ModBus output	
LON-Koppler	DGC-05-RS-485-LON	RS485/LON-Coupler	
Bac-Koppler	DGC-05-RS-485-Bac	RS485/BacNet	
Mod-Koppler	DGC-05-RS-485-ModBus	RS485/ModBus	
GPRS-Module	DGC-05-ModBus-GPRS	ModBus/GPRS-Modul without SIM-Card	
Koppler-Cases	DGC-xxx-05-xtx	Enclosure for coupler with 230 V power supply	

Tools for DGC

Tool		
Tool	DT-05- STL	Service tool with keypad and LCD
PC-Soft 1	PC-Easy Soft 1	Calibration and configuration software with logger function
PC-Soft 2	PC-Easy Soft 2	Configuration software
PC-Soft 2 Up	PC-Easy Soft 2 Up	Configuration software, update to new version
Credits	DGC-05-K	Credits (100 pcs) for service tool / PC Easy Soft

¹ extended with EP modul
² please specify at order

Features

- Digital controller for ADT and MD transmitters
- up to 98 bus transmitters, or 48 pairs of bus transmitters with analog transmitters
- up to 30 relay outputs, up to 12 analog outputs

Short term

Item number

Description

OPTIONS

DGC-USV1	DGC-05-XX-3-X-X-X-XXXXXX-XX	Emergency power supply for DGC-05-24-04-xxxx
DGC-USV2	DGC-05-XX-4-X-X-X-XXXXXX-XX	Emergency power supply for DGC-05-xx-xx-xxxx
DGC-Lock	DGC-05-XX-X-X-X-X-XXX1XX-XX	Lock incl. installation (lockable)
DGC-Buzzer	DGC-05-XX-X-X-X-X-X1XXXX-XX	Integrated buzzer
DGC-Power	DGC-05-XX-X-X-X-X-1XXXXX-XX	Power fail flashing light
DGC-Menü		Menu language ²
DGC-Metal	DGC-05-XX-X-X-X-8-XXXXXX-XX	Metal housing instead of plastic housing for Controller
DGC-UL	DGC-05-XX-X-X-X-X-X2XXXX-XX	Housing with UL certification
DGC-Relay	DGC-Relay	Relay to double up 1 Alarm output

Door Entrance Module

DEM-X3	DEM-X3-A-100	Door Entrance Module with Display
DEM-X3 B	DEM-X3-A-110	Door Entrance Module with Display and Buzzer
DEM-X3 SF	DEM-X3-A-101	Door Entrance Module with Display, Buzzer and red Flashlight



DESCRIPTION

The gas controller series DGC-05 can monitor up to 98 digital gas transmitters of the DT-05 series via RS-485 bus, or 48 digital transmitters DT-05 with in each case one transmitter of the AT series. For each transmitter five free alarm thresholds are adjustable. For the alarms up to 30 relays with changeover contact are available.

The adjustable parameters and alarm thresholds enable a very flexible use in the gas measuring technique. Simple and comfortable commissioning is granted by the factory-set parameters. Configuration, parameterization and operation are easy to do without programming knowledge due to the logical, simple menu structure.

Warning Devices



Short term	Item number	Description
WT-G1	WT-G1-30-III-RW	LED warning sign G1 - VDI 2053 Gasalarm

OPTIONS

IP 54	WT-xx-xx-xxx-xx-IP54	Warning Sign in IP54
Text	WT-ST-xx-xxx-xx	Text at customer's choice, in capital letters, price per side

Connection Boxes

WT-AD30	WT-xx-30-xxx-xx	Power input 24 VAC/DC
WT-AD31	WT-xx-31-xxx-xx	Power input 24 VAC/DC, with buzzer
WT-AD10	WT-xx-10-xxx-xx	Power input 230 VAC
WT-AD11	WT-xx-11-xxx-xx	Power input 230 VAC, with buzzer

Warning Devices

BL	BL-24	Flashlight
WH-24	WH-24	Warning horn, 24 VDC
WH-230	WH-230	Warning horn, 230 VAC
WH/BL 24	WH/BL-24	Combination warning horn / flashlight, 24 VDC
WH/BL 230	WH/BL-230	Combination warning horn / flashlight, 230 VAC

Features

- Low Power LED Technology
- 24 VAC/DC
- Different connection boxes with various power inputs

DESCRIPTION

The calibration equipment is used for routine calibration and testing of the transmitters.

For service and maintenance as required per regulation this equipment fulfils the standards to keep the accuracy of the gas warning systems.

Calibration Equipment

Short term	Item number	Type of gas ¹
ZERO-GAS	TG-34-DS-Zero	Air Zero, gas volume 34 l
NH3-GAS 200	TG-34-DAL-NH3-200	Ammonia 200 ppm, air balance, gas volume 34 l
NH3-GAS 1000	TG-34-DAL-NH3-1000	Ammonia 1000 ppm, air balance, gas volume 34 l
NH3-GAS 10000	TG-34-DAL-NH3-10000	Ammonia 10000 ppm, air balance, gas volume 34 l
CO2-GAS 2000	TG-34-DS-CO2-2000	Carbon dioxide 2000 ppm, air balance, gas volume 34 l
CO2-GAS 5000	TG-34-DS-CO2-5000	Carbon dioxide 5000 ppm, air balance, gas volume 34 l
CO2-GAS 5	TG-34-DS-CO2-5	Carbon dioxide 5 vol%, air balance, gas volume 34 l
C2H4-GAS-10	TG-17-DS-C2H4-10	Ethylene 10 ppm, air balance, gas volume 17 l
C2H4-GAS-500	TG-17-DS-C2H4-500	Ethylene 500 ppm, air balance, gas volume 17 l
CH4-GAS	TG-34-DS-CH4-2,2	Methane 2.2 vol%, 50 %LEL, air balance, gas volume 34 l
O2-GAS	TG-34-DS-O2-10	Oxygen 10 vol%, nitrogen balance, 34 l
C3H8-GAS	TG-34-DS-C3H8-1,1	Propane 1 vol%, 50 %LEL, air balance, 34 l
R22-GAS1000	TG-34-DS-R22-1000	R22 1000 ppm, air balance, 34 l
R123-GAS100	TG-17-DS-R123-100	R123 100 ppm, air balance, 17 l
R123-GAS2000	TG-17-DS-R123-2000	R123 2000 ppm, air balance, 17 l
R134a-GAS100	TG-34-DS-R134a-100	R134a 100 ppm, air balance, 34 l
R134a-GAS1000	TG-34-DS-R134a-1000	R134a 1000 ppm, air balance, 34 l

Regulators

(please indicate on order which flowrate)

		Description
Reg DS	Regulator DS	Regulator for test gas bottles 17 DS and 34 DS, 0.15 l/min
Reg DAL	Regulator DAL	Regulator for test gas bottles 34 DAL, 0.15 l/min
Reg DSF	Regulator DSF	Regulator with flowmeter for test gas bottles 17 DS and 34 DS
Reg DALF	Regulator DALF	Regulator with flowmeter for test gas bottles

Calibration Kit

(consists of tube and adapter for sensor, without gases, regulators or other tools)

Cal 1	Calibr-set-1	Calibration kit for Tox transmitters, size 4 (Series 0, 2, 3, 4, 9)
Cal 2	Calibr-set-2	Calibration kit for Tox transmitters, size 7 (Series 1, 5, 6)
Cal 3	Calibr-set-3	Calibration kit for EX transmitters (Series 0, 1, 2)
Cal 4	Calibr-set-4 ⁵	Calibration kit for IR transmitters (Series D) "A"-housing
Cal 5	Calibr-set-5 ⁵	Calibration kit for IR transmitters (Series D) "C" and "E"-housing
Cal 7	Calibr-set-7	Calibration kit for MA - transmitters (Series MA) "F" and "D"-housing

Carrying Cases^{3,4}

Demo-Case	Demo-Case	Case for demo equipment 620*320*120 mm (w*h*d)
Service-Case	Service-Case	Case for service equipment 410*310*100 mm (w*h*d) for max. 2 gas bottles 34 DS or DAL, 1 regulator and 1 calibration kit

¹ others on request

² test gas for cross-sensitivity calibration - accuracy shown in our manual

³ without products

⁴ please specify at order

⁵ needs flow rate of 1.5 l/min



Features

- One-way gas bottles with 17 or 34 l gas volume
- Regulators with constant flow 0.15 l/min.¹

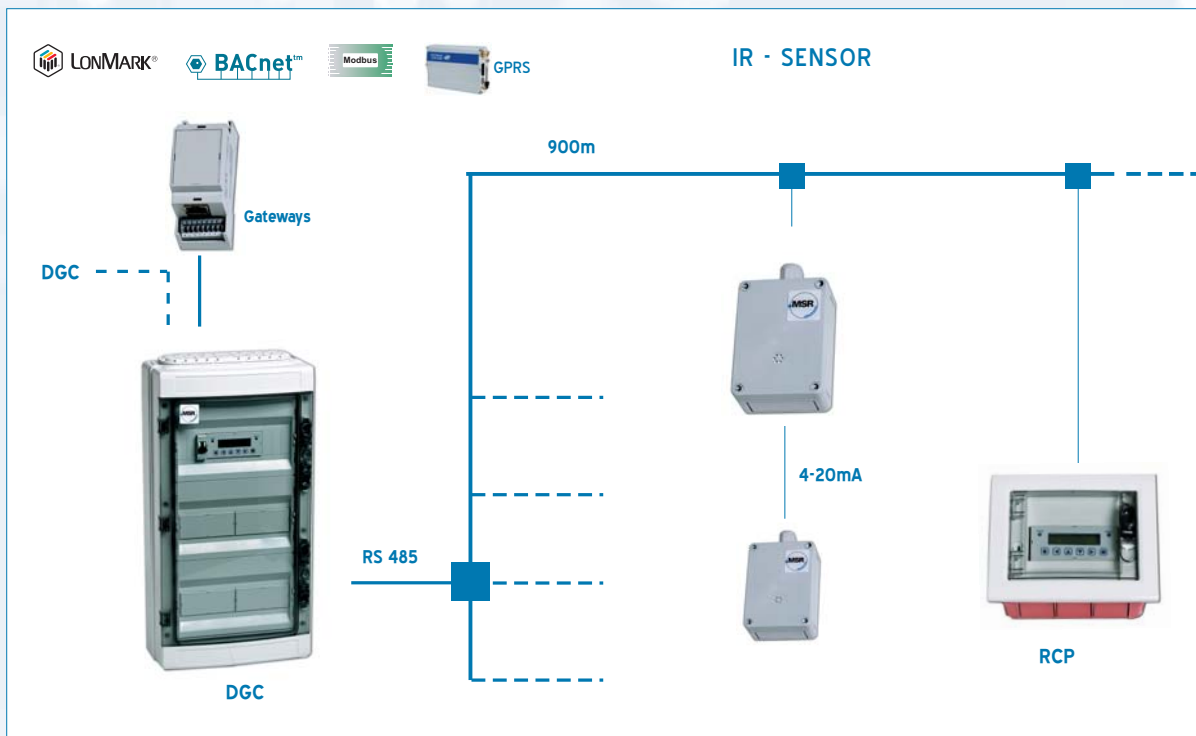
DESCRIPTION

The warning devices are used for the optical and audible warning of dangerous Gas concentration and vapours in garages, tunnels and other

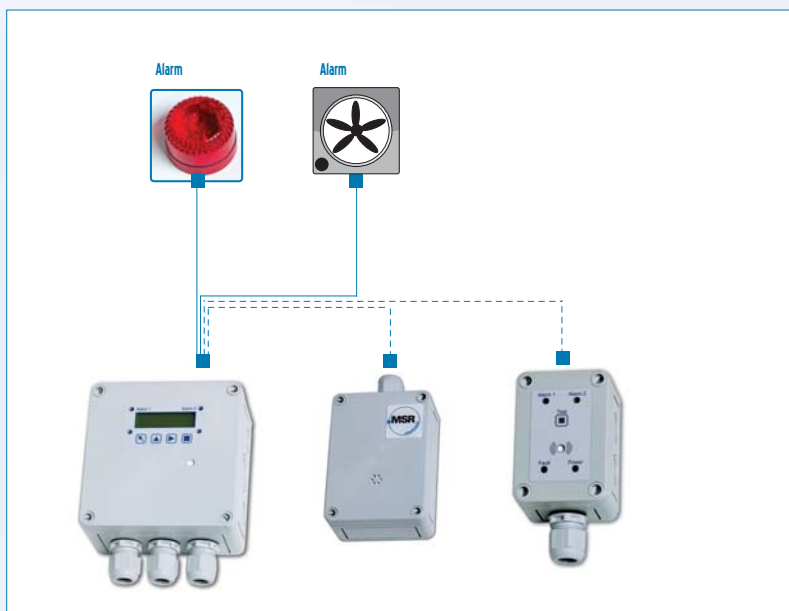
LEAKAGE DETECTION

The products of MSR Electronic are suitable for a wide range of industrial and commercial applications and fulfill e.g. the functions for leakage detection in dispensing systems, breweries, cold rooms, large cooling systems, cold storage houses, refrigerated containers etc. according to current regulations.

Whether as gas detection systems for large systems with connection to a BMS system or as single room monitoring. The components of MSR Electronic can be individually assembled for you.



The Controller of a DGC-System manages several sensors via one or more bus lines. Optionally there is the possibility to connect additional analog transmitters to every BUS knot and integrate them into the system.

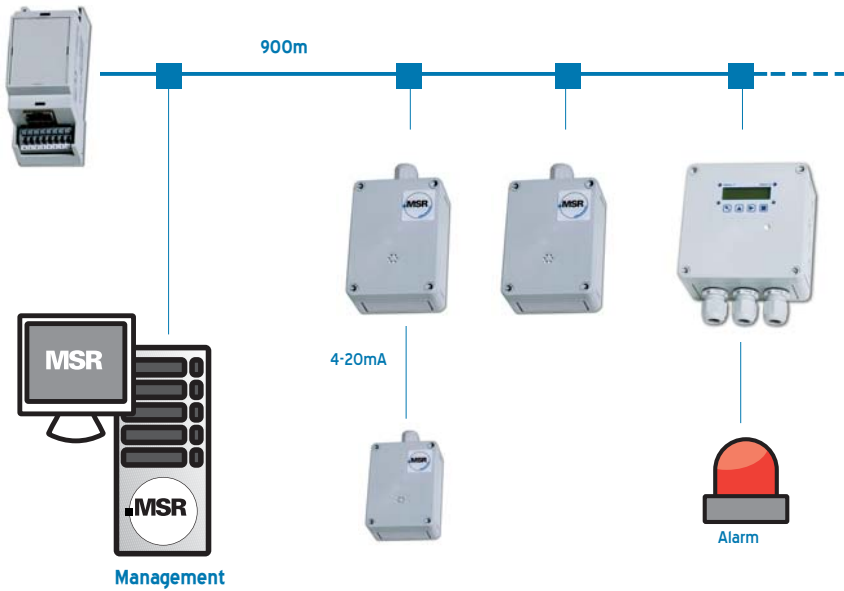


In case of single space monitoring system the leaking gas is measured directly at the SPC (Single-Point-Controller) where also the alarms are given. An external transmitter is additionally connectable. A remote display panel (RDP03) outside of the danger area for external alarm to avoid entering, is optionally integrable.

El.chem. - SENSOR

PELLISTOR

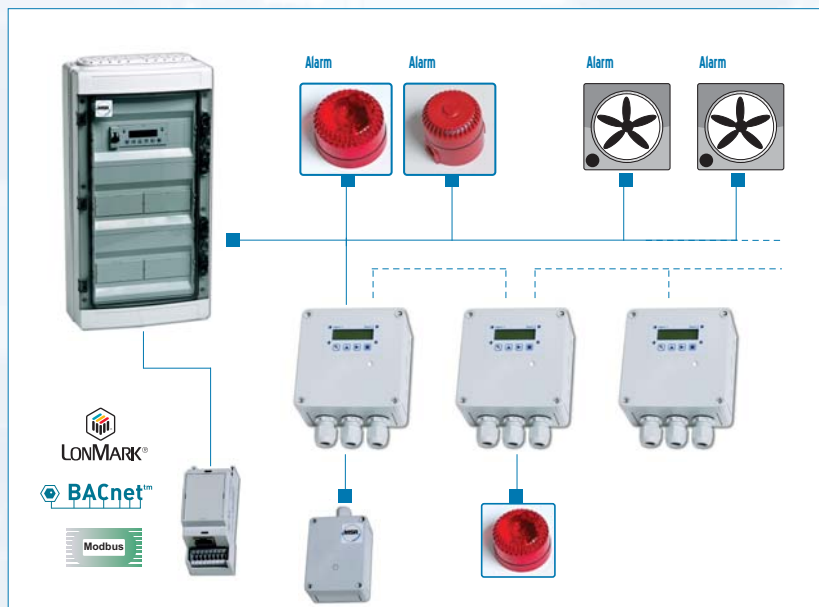
SEMICONDUCTOR - SENSOR



CO₂
 NH₃
 Freon
 R134a
 R404a
 R410a
 R1234yf
 R507
 R22

...

Bus extensions via repeater are possible at every point of the bus line. External display panels (RDP) and connections to a BMS system are also integrable. Alarm is given centrally at the DGC-Controller or locally at the transmitter or I/ O modules.



Several single space monitoring systems can be connected to a master controller via bus line. Consequently there is the possibility of a central analysis, central alarms and a connection to a BMS system.

PERFECT SOLUTIONS FOR APPLICATIONS



GARAGES

PolyGard CO / NO_x / LPG sensors are used in parking garages and loading areas for the continuous monitoring of harmful gas concentrations in the air. Whether as classic CO warning system or as gas warning system combined with NO_x (nitrogen oxides) and EX (LPG) measurement, the MSR gas warning systems protect human health and safety in these areas.



CHILLER SYSTEMS

PolyGard NH₃ / Freons / CO₂ - Sensors are used for the detection of leakages in cooling systems. Refrigerants are highly toxic and / or harmful to the environment. Accidental escape of the refrigerant is to avoid at any case. The MSR transmitters detect reliably any escape of the refrigerant gas and protect in combination with the MSR controllers and warning devices primarily persons, but also the plant. MSR Electronic products comply with current regulations.



HEATING

Polygard EX sensors are used for monitoring leakage of the pipes in gas heating systems and gas distributors.



OFFICE

PolyGard VOC / CO₂ / O₂ sensors are used for monitoring the air quality in offices or for monitoring leakages of CO₂ in production areas (beverage industry). Whether for monitoring the air quality or for surveillance of gas ducts, MSR Electronic detectors measure continuously the ambient air to detect reliably all harmful gases or vapours.



CELLAR SYSTEMS

Whether in pubs, restaurants, fermenting cellars, breweries, wineries, bottling plants or even in storage facilities and production halls with CO₂ extinguishing devices, everywhere CO₂ bottles, gas lines and tanks are employed, PolyGard CO₂ / O₂ sensors can be used for monitoring the air quality. Whether for the compliance with the OEL values or for revealing leakages, MSR transmitters always detect reliably harmful concentrations of gases and vapours in the ambient air.



LABORATORY

PolyGard CO₂ / O₂ / EX sensors are used for assuring the adherence to the OEL values in laboratories and in food production. The gas warning systems of MSR Electronic is not only for protecting the plant, but also and especially for protecting humans from being poisoned. Additionally our products comply with current regulations.



CAR REPAIR SHOPS

Whether in car or truck repair shops, the PolyGard sensors are used for monitoring and warning of harmful gases and vapours. Regardless if exhaust gases, welding vapours, varnish gases or leaky gas bottles, MSR sensors always detect reliably harmful concentrations of gases and vapours in the ambient air and protect persons and equipment.



POOL & SPORT

PolyGard Cl_2 / O_3 sensors are used in swimming pools of all sizes for detecting leakages in chlorine or ozone systems to protect human safety and the equipment. MSR transmitters always detect reliably harmful concentrations of gases and vapours in the ambient air. In combination with the controllers and warning devices (e.g. warning signs and horns) they protect life and health of the bathers and employees.



BATTERY ROOMS

PolyGard EX sensors are used for monitoring battery recharging areas. The EX sensors are employed for detecting hydrogen concentrations in the air. This explosive hydrogen gas is produced during battery charging. MSR sensors protect persons and equipment against explosions caused by ignition of the hydrogen gas.



WASTEWATER & PUMP

Whether in commercial or industrial pump stations - fresh water or wastewater - standard or ATEX proven - PolyGard sensors are employed for detecting harmful concentrations in the air and so protect persons and equipment.



OPERATING THEATRES

PolyGard N_2O / CH_2O sensors are used for complying the OEL values in operating theatres and areas of medical technology. The MSR Electronic gas warning systems not only protect the building equipment, but first and foremost they keep humans from being poisoned. In operating theatres the surgical team is prevented from continuous exposure to gases. The products comply with the current regulations as well.



HIGH VOLTAGE

PolyGard SF_6 sensors are used for detecting leakages in gas-isolated high voltage plants or in production plants manufacturing gas-isolated systems. The gas warning systems of MSR Electronic not only protect the plant and the environment, but also and predominantly they keep the humans from being poisoned. The products comply with the current regulations as well.

THE GASES

EX Combustible Gases

CODE	Gas*	Chem. formula	Max. range**	For detector series
3488	Acetic acid	C ₂ H ₄ O ₂	0-100 %LEL	XT-1-X1
3405	Acetylene	C ₂ H ₂	0-100 %LEL	XT-1-X2, FT
3485	Acetone	C ₃ H ₆ O	0-100 %LEL	XT-1-X1, ADT, SPC, ADL
3408	Ammonia	NH ₃	0-100 %LEL	XT-1-X2, ADT, SPC, ADL, MA
3430	Benzene	C ₆ H ₆	0-100 %LEL	XT-1-X2, ADT, SPC, ADL
34AB	Butyl acetate	C ₆ H ₁₂ O ₂	0-100 %LEL	XT-1-X1
3415	Cyclohexane	C ₆ H ₁₂	0-100 %LEL	XT-1-X1
3472	Cyclopentane	C ₅ H ₁₀	0-100 %LEL	XT-1-X1
3420	Ethane	C ₂ H ₆	0-100 %LEL	XT-1-X1
3427	Ethyl acetate	C ₄ H ₈ O ₂	0-100 %LEL	XT-1-X1, ADT, SPC, ADL
3445	Ethyl alcohol	C ₂ H ₆ O	0-100 %LEL	XT-1-X1
3425	Ethyl alcohol	C ₂ H ₆ O	0-100 %LEL	ADT, SPC, ADL
3410	Ethylene	C ₂ H ₄	0-100 %LEL	XT-1-X1, ADT, SPC, ADL, MA, FT
3412	Ethylene oxide	C ₂ H ₄ O	0-100 %LEL	XT-1-X2
34EE	Ethyl ether	C ₄ H ₁₀ O	0-100 %LEL	XT-1-X1
3440	Hydrogen	H ₂	0-100 %LEL	XT-1-X1, ADT, SPC, ADL
3465	Isobutane	C ₄ H ₁₀	0-100 %LEL	XT-1-X1
3468	Isobutyl alcohol	C ₄ H ₁₀ O	0-100 %LEL	XT-1-X1
3476	Isopentane	C ₅ H ₁₂	0-100 %LEL	XT-1-X1
3445	Isopropanol alcohol	C ₃ H ₈ O	0-100 %LEL	XT-1-X1, ADT, SPC, ADL
3482	Isopropyl alcohol	C ₃ H ₈ O	0-100 %LEL	XT-1-X1
3498	JP8		0-100 %LEL	XT-1-X2, ADT, SPC, ADL
3402	LPG		0-100 %LEL	XT-1-X1, XT-2, ADT, SPC, ADL, MA
3400	Methane	CH ₄	0-100 vol%	XT-1-X1, XT-1X, XT-2, ADT, SPC, ADL, MA, FT
3450	Methanol	CH ₄ O	0-100 %LEL	XT-1-X1, ADT, SPC, ADL
3458	Methyl ethyl ketone	C ₄ H ₈ O	0-100 %LEL	XT-1-X1, ADT, SPC, ADL
3460	n-Butane	C ₄ H ₁₀	0-100 vol%	XT-1-X1, XT-2, ADT, SPC, ADL, FT
3491	n-Heptane	C ₇ H ₁₆	0-100 %LEL	XT-1-X1, ADT, SPC, ADL
3435	n-Hexane	C ₆ H ₁₄	0-100 %LEL	XT-1-X1, ADT, SPC, ADL
3470	n-Octane	C ₈ H ₁₈	0-100 %LEL	ADT, SPC, ADL
3475	n-Pentane	C ₅ H ₁₂	0-100 %LEL	XT-1-X1, ADT, SPC, ADL
3482	Nitrogen trifluoride	NF ₃	5-50 ppm	ADT, SPC, ADL
3495	Nonane	C ₉ H ₂₀	0-100 %LEL	XT-1-X1
3496	Petrol vapours		0-100 %LEL	XT-1-X1, XT-2
3480	Propane	C ₃ H ₈	0-100 vol%	XT-1-X1, XT-2, ADT, SPC, ADL, MA, FT
3478	Propene	C ₃ H ₆	0-100 %LEL	XT-1-X1
3484	Propyl alcohol	C ₃ H ₈ O	0-100 %LEL	XT-1-X1
3492	Styrene	C ₈ H ₈	0-100 %LEL	XT-1-X2
3490	Toluene	C ₇ H ₈	0-100 %LEL	XT-1-X1, ADT, SPC, ADL
1194	Trimethylbenzene	C ₉ H ₁₂	0-100 %LEL	XT-1-X1
34AV	Vinyl acetate	C ₄ H ₆ O ₂	0-100 %LEL	XT-1-X1
3493	Xylene	C ₈ H ₁₀	0-100 %LEL	XT-1-X1

* others on request

** please see corresponding datasheet for more

TOX Toxic Gases

CODE	Gas*	Chem. formula	Max. range**	For detector series
1120/25	Ammonia	NH ₃	0-35000 ppm	XT-1, XT-2, ADT, SPC, ADL, MA
1160-64	Carbon dioxide	CO ₂	0- 100 vol%	XT-1, XT-2, ADT, SPC, ADL, FT
1110	Carbon monoxide	CO	0-100 vol%	XT-1, XT-2, ADT, SPC, ADL, MA, MD, FT
1193	Chlorine	Cl ₂	0-20 ppm	XT-1, XT-2, ADT, SPC, ADL
1181	Chlorine dioxide	ClO ₂	0-1 ppm	ADT, SPC, ADL
1189	Ethylene	C ₂ H ₄	0-2000 ppm	XT-2, ADT, SPC, ADL, FT
1198	Fluorine	F ₂	0-5 ppm	ADT, SPC, ADL, MA
1185	Formaldehyde	CH ₂ O	0-10 ppm	ADT, SPC, ADL
4266	Freon*	R11	0-2000 ppm	ADT, SPC, ADL, MA
4270	Freon*	R22	0-2000 ppm	ADT, SPC, ADL, MA, FT
4264	Freon*	R123	0-2000 ppm	ADT, SPC, ADL, MA, FT
4265	Freon*	R125	0-2000 ppm	ADT, SPC, ADL, FT
4265	Freon*	R124	0-2000 ppm	ADT, SPC, ADL, MA, FT
4277	Freon*	R134a	0-2000 ppm	ADT, SPC, ADL, MA, FT
4271	Freon*	R401a	0-2000 ppm	ADT, SPC, ADL, MA
4272	Freon*	R401b	0-2000 ppm	ADT, SPC, ADL, MA
4273	Freon*	R402a	0-2000 ppm	ADT, SPC, ADL, MA
4274	Freon*	R402b	0-2000 ppm	ADT, SPC, ADL, MA
4278	Freon*	R404a	0-2000 ppm	ADT, SPC, ADL, MA, FT
4282	Freon*	R407c	0-2000 ppm	ADT, SPC, ADL, MA
4275	Freon*	R408a	0-2000 ppm	ADT, SPC, ADL, MA
4276	Freon*	R409a	0-2000 ppm	ADT, SPC, ADL, MA
4268	Freon*	R410a	0-2000 ppm	ADT, SPC, ADL, MA
4267	Freon*	R411a	0-2000 ppm	ADT, SPC, ADL, MA
4279	Freon*	R416a	0-2000 ppm	ADT, SPC, ADL, MA
4269	Freon*	R507	0-2000 ppm	ADT, SPC, ADL, MA
1186	Hydrogen chloride	HCl	0-20 ppm	ADT, SPC, ADL
1183	Hydrogen cyanide	HCN	0-100 ppm	ADT, SPC, ADL
1182	Hydrogen fluoride	HF	0-10 ppm	ADT, SPC, ADL
1197	Hydrogen sulfide	H ₂ S	0-200 ppm	XT-1, XT-2, ADT, SPC, ADL
1180	Methyl bromide	CH ₃ Br	0- 2.5 vol%	ADT, SPC, ADL
1129	Nitric oxide	NO	0-20 ppm	XT-1, XT-2, ADT, SPC, ADL, MA
1130	Nitrogen dioxide	NO ₂	0-25 ppm	XT-1, XT-2, ADT, SPC, ADL, MA
1192	Nitrous oxide	N ₂ O	0-2000 ppm	ADT, SPC, ADL
1190	Ozone	O ₃	0-5 ppm	ADT, SPC, ADL
1187	Phosphine	PH ₃	0-5 ppm	ADT, SPC, ADL
1188	Silane	SiH ₄	0-50 ppm	ADT, SPC, ADL
1196	Sulphur dioxide	SO ₂	0-100 ppm	XT-1, XT-2, ADT, SPC, ADL, MA
1184	Sulphur hexafluoride	SF ₆	0-100 vol%	ADT, SPC, ADL, FT
1160	VOC + CO ₂	VOC	0-2000 ppm	ADT, SPC, ADL, IAQ

O₂ Oxygen

1195	Oxygen	O ₂	0-25 vol%	XT-1, XT-2, ADT, SPC, ADL, MA
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* others on request

** please see corresponding datasheet for more

General Terms and Conditions

Terms and Conditions of Sale

DEFINITIONS:

- (a) "Goods" means the Goods or services which the company is to supply in accordance with these terms.
- (b) "Company" means MSR-Electronic GmbH.
- (c) "Terms and Conditions" means the terms and conditions of sale set out below and any specific terms and/or conditions agreed in writing between the Customer and the Company.
- (d) "Contract" means the Contract for the purchase and sale of Goods.
- (e) "Writing" includes communication by post, facsimile, e-mail and by personal delivery of documents.
- (f) "Acceptance" means confirmation in writing by the Company upon receipt of the Customer's order.
- (g) "Customer" means the person described overleaf.

1. APPLICATION

Unless otherwise specifically agreed in writing these Conditions shall be incorporated in every offer quotation acceptance and contract for the sale or supply of goods or services by the Company and together with the order to which they relate constitute the entire contract between the Company and the Customer. Any conditions proposed by the Customer which are inconsistent with these terms are hereby excluded.

2. ACCEPTANCE

All quotations are given subject to confirmation in writing by the Company upon receipt of the Customer's order and no contract shall be concluded until such confirmation is given or the Customer's order is otherwise accepted. Unless otherwise stated in writing by the Company each order when accepted constitutes a separate contract.

3. PRICES

- (a) Prices quoted are exclusive of VAT (unless otherwise stated) and are those in force at the date of quotation. Unless otherwise stated in the quotation (if any) given by the Company they may be varied at any time before delivery of the Goods or before performance of the Services provided the prices may be varied after a contract has become binding only by reason of an increase in the cost of the Company of raw materials or labour or by reason of a fluctuation in exchange rates.
- (b) If prices are varied after a contract has become binding the Company shall give the Customer written notice of such variation and on receipt of such notice the Customer may cancel his order. In a case where goods are to be delivered or services are to be supplied in instalments the Customer may cancel payments only for the undelivered goods or the unperformed part of the Services. If the order is not cancelled the Customer shall be bound to pay the increased or varied price in respect of the goods delivered or Services performed after such notice is received. To be effective cancellations must be in writing and must be received by the Company either within fourteen days of the date in which such notice was sent or at least twenty-eight days before delivery or performance is due, whichever is the sooner.
- (i) The Company reserves the right, by notice to the Customer at any time before delivery, to increase the price of Goods and to alter the terms of payment and delivery dates as in the circumstances the Company shall consider it fair and reasonable to reflect any increase in cost due to information supplied by or on behalf of the Customer being insufficient, incorrect, inaccurate, or misleading to delay caused by the Customer, or if the Customer notifies the Company of any change of requirement in relation to any order after the acceptance thereof by the Company.
- (c) Unless otherwise expressly agreed prices quoted are ex works and exclude all cost of packaging and delivery from the Company's premises but these may be charged as extras.
- (i) Any variation or amendment requested by the Customer will only be valid and binding on the Company when subject to a change order relating to the order duly placed upon and accepted by the Company in writing and signed by a duly authorised representative, and subject to appropriate adjustment in price, delivery dates and other matters.
- (d) Unless otherwise expressly agreed in the case of export sales, prices quoted also exclude all overseas taxes and tariffs and all costs of delivery which may be charged as extras.

4. DELIVERY

- (a) Delivery or periods are only best estimates and the Company is not liable for the consequences of any delay.
- (b) Any delivery or performance period begins on the date of the Company acceptance of the Customer's order or (if later) when the Company receives from the Customer any further information which it may require to proceed with the contract. The Customer agrees to supply such information promptly and to accept the Goods within the delivery or performance schedule or timetable specified in the contract and to give any necessary instructions for delivery or performance accordingly.
- (c) The Customer shall in all cases other than export sales provide the labour necessary to the Company to unload and stack free of charge to the Company and shall ensure that the delivery vehicle is unloaded within a reasonable time and shall indemnify the Company against any loss or damage arising during unloading.
- (d) The Company will supply Goods according to the specification as set out in the Quotation.
- (e) Any typographical, clerical error or other omission in documents issued by the Company shall be subject to correction by the Company without liability on the part of the Company.
- (f) The Customer must examine the Goods immediately upon delivery and within 7 days thereafter notify the Company in writing of any defects, and return any allegedly defective part or parts of the Goods to the Company or as the Company shall direct at the Customer's expense within 18 days of delivery and pay to the Company the costs of any tests carried out to such part or parts (such cost to be certified by the Company) together with the costs of return thereof to the Company in the event that no liability attaches to the Company in respect of defects. Where damage occurs, not apparent on reasonable inspection, the Customer must notify the Company within 7 days within the discovery of any such damage. In default the Buyer will be deemed to have examined and accepted the Goods.
- (g) The Company shall not be liable for any loss or damage caused by or resulting from any variation (for whatever reason) in the specifications or technical data of any outside manufacturer or for any loss or damage arising out of curtailment or cessation of supply following such variation.
- (h) The Company will repair or at its option replace free of charge any part of the Goods lost or damaged in transit provided that (if the Company appoints the carrier) the Company and the carrier are given written notice of such loss or damage within the time required by the carrier's Conditions of Carriage. Alternatively where delivery is made by the Company's own transport the Company should be given written notice within three days of the arrival of the Goods or in the case of non-delivery within fourteen days of dispatch. This clause shall not apply to export sales.

5. RISK

- (a) The Goods shall be and thereafter remain in the Customer's risk from the time of delivery to the Customer or elsewhere specified by the Customer.
- (b) In the case of an export sale the Goods shall be and thereafter remain at the Customer's risk from the time of delivery to the Customer's carriers. The signed acceptance document of the Customer's carriers shall be proof of proper delivery.
- (c) The Company shall take all due reasonable skill and care in the performance of the Services but no other standard of skill or care shall be expressed or implied by law or otherwise.

6. RETENTION OF TITLE

- (a) (i) Upon delivery of the Goods to the Customer or into custody on the Customer's behalf, the title of Goods shall not pass to the Customer and the Customer shall hold the Goods as bailee for the Company until the later payment in full of all monies owing by the Customer to the Company or:
 - (i) Recover of physical possession of the Goods by the Company pursuant to a Return Notice; or
 - (ii) Payment in full of all monies owing by the Customer to the Company (whichever first occurs) and shall (unless otherwise agreed) store the Goods separately from his own Goods in such fashion as to be readily identifiable by the Company.
 - (iii) The recovery of physical possession of the Goods by the Company pursuant to Return Notice and shall (unless otherwise agreed) store the Goods separately from his own Goods in such fashion as to be readily identifiable by the Company.
- (2) Until such time as the Customer ceases to hold the Goods as bailee for the Company under sub-clause (a) (i) above the Company shall retain full legal and equitable title to the Goods and may at any time give written notice to the Customer requiring the Customer to redeliver the Goods to the Company (a "Return Notice") whereupon the Customer shall forthwith place the Goods at the disposal of the Company who shall be entitled to enter upon any premises of the Customer for the purpose of removing the Goods and to remove such Goods.
- (3) The Customer shall insure the Goods in their full reinstatement value and shall if required note the interest of the Company on the relevant policy.
- (4) The Company shall be deemed to have given a Return Notice to the Customer if a receiver is appointed over any of the assets or undertaking of the Customer or a winding up order is made against the Customer or the Customer goes into voluntary liquidation or calls a meeting of or makes any arrangement or composition with creditors or commits an act of bankruptcy.
- (b) (i) Subject to sub-clause (b) (3) below the Customer shall be at liberty to transfer the ownership of the Goods in the normal course of trading provided that the Customer shall have no authority to enter into any contract or sale on behalf of the Company and any contract shall accordingly be concluded in the name of the Customer. The proceeds of any such sale shall be kept separate from the Customer's own money and shall be applied in discharging the indebtedness of the Customer to the Company provided that any surplus remaining after all amounts owing to the Company by the Customer have been satisfied shall be made over to the Customer.

(2) If the proceeds of any such sale shall remain outstanding for more than seven days after they fall due to the Customer the Customer shall notify the Company and if so required shall assign to the Company the right to recover such proceeds.

(3) The Customer's liberty to transfer the ownership of the Goods under sub-clause (b) (1) of this clause shall cease on receipt of a Return Notice given or deemed to be given under this clause.

7. LAW

The validity construction and performance of any contract to which these conditions apply shall be governed by the law of Germany and any disputes shall be submitted to the German Courts.

8. PAYMENT

(a) Payment by the Customer is due within 30 (thirty) days of the date of the invoice.

(b) If the Customer fails to pay the Company by the due date the Company may either suspend all further deliveries or performance of Services until payment is made in full or cancel the order and subsequent ordered insofar as goods remain to be delivered or Services remain to be performed thereunder.

(c) The Company reserves the right to charge interest when payment has not been made on the due date at the rate (both before and after judgement) or three per cent above HypoVereinsbank-Germany base rate for the time being calculated on the outstanding balance from the due date for payment down to receipt by the Company of payment.

(d) If the Customer fails to give the Company delivery instructions promptly when required payment shall be due forthwith and the Company shall be entitled (but not bound) to store the Goods at the Customer's expense and to recover the cost of any insurance which the Company in its discretion considers appropriate.

(e) Any sums paid by deposit, retainer or prepayment are not refundable in the event of a Customer cancelling an order. The Company reserves the right at any time and it's discretion to demand security for payment before continuing with or delivering any order.

9. GUARANTEE OF QUALITY

The Company shall have the right, whether before or after the date of the order, to alter the specification of the Goods or any part thereof provided that such alterations shall not adversely affect the performance of the Goods and for the avoidance of doubt it is agreed that the sale and purchase shall not be a sale or purchase by sample.

10. LOSS OR DAMAGE IN TRANSIT

The Company will repair or at its option replace free of charge any part of the Goods lost or damaged in transit provided that (if the Company appoints the carrier) the Company and the carrier are given written notice of such loss or damage within the time required by the carrier's Conditions of Carriage. Alternatively where delivery is made by the Company's own transport the Company should be given written notice within three days of the arrival of the Goods or in the case of non-delivery within fourteen days of despatch. This clause shall not apply to export sales.

11. USE OF THE GOODS

Where the Goods are plant for use or operation at work (or are components for such plant) it is the Customer's responsibility to ensure that proper standards of safety are maintained in using the Goods and (without limitations) to pass on all instructions regarding such use to personnel and to arrange for their training in such use where appropriate.

12. INTELLECTUAL PROPERTY

(a) The Company will indemnify the Customer against any claim for infringement of Letters Patent Registered Design Trade Mark or Copyright ("Intellectual Property Rights") by the use or sale of any of the Goods against all costs and damages which the Company may incur in any action for such infringement or for which the Customer may become liable in any such action. Provided always that this indemnity shall not apply to any infringement which is due to the Company having followed any instructions furnished or given by the Customer or to the use of such Goods in a manner or for a purpose or in a foreign country not specified by or disclosed to the Company or to any infringement which is due to the use of the Goods in association or combination with any other goods not supplied by the Company. And provided also that this indemnity is conditional upon the Customer giving to the Company notice within 7 days in writing of any claim being made or action threatened or brought against the Customer and on the Customer permitting the Company at the Company's own expense to conduct any litigation that may ensue and all negotiations of the claim. The Customer warrants that any instruction furnished or given by it shall not be such as will cause the Company to infringe any intellectual Property Rights.

(b) The Customer shall indemnify the Company for any loss damage expense or liability in any suit or proceeding based upon any claim for the infringement of Intellectual Property Rights brought against the Company resulting from the Company's compliance with the Customer's designs or specifications and for any such infringement involving any marking or branding applied by the Company at the request of the Customer.

13. LIABILITY

(a) Except as expressly otherwise provided in these Conditions the Company shall be under no liability:

(i) In respect of the quality condition or description of Goods supplied or the fitness for any particular purpose; or

(ii) for loss or damage (whether consequential or indirect) caused by the negligence of the Company or otherwise howsoever to the Customer or to any other person; or

(iii) for death or personal injury caused otherwise than by the negligence of the Company to the Customer or to any other person. Any term condition or representation contrary to this Condition whether express or implied by statute common law or otherwise is hereby expressly excluded.

(b) The Customer shall indemnify the Company against all damage or injury to any person firm or company and against all actions claims demands costs charges and expenses (including costs charged on a reasonable basis for the time of the Company's executives) for which the Company may become liable in respect of the Goods sold or Services supplied under a contract except to the extent admitted expressly in these Conditions and unless such damage or injury shall have been a direct result of the negligence of the Company and can be attributed to no other cause (whether in whole or in part).

(c) The Company shall not be liable, whether in contract, tort (including negligence) or otherwise in respect of any indirect or consequential loss suffered by the Customer or by any third party, including, without limitation, lost profits, lost business, lost sales, lost goodwill and lost anticipated savings.

(d) Nothing in these terms excludes any parties liability in respect of death or personal injury caused by its negligence or that of its agents, employees, contractors or representatives.

(e) Save as expressly set out in these terms or in any documents which accompany them, the Company excludes all conditions and warranties, whether express or implied, written or otherwise.

14. FORCE MAJEURE

(a) The Company shall not be liable to the Customer to the extent that fulfilment of its obligations to the Customer has been prevented hindered or delayed by force majeure as herein defined.

(b) For the purpose of this Condition force majeure shall mean any circumstance beyond the control of the Company and shall include (without limitation):

(i) Riot, civil commotions, war, rebellion, national or international emergency, strikes, lockouts or other labour disputes

(ii) Destruction or damage due to natural cause, floods, fires, explosions or breakdown of machinery

(iii) Any order of a local national or international authority (iv) Shortage of labour equipment materials or supplies (v) Transportation embargoes of failure or delays in transport.

15. REGULATIONS

The Customer warrants that it has complied with every applicable lawful requirement or instruction and (without Limitation) that it has obtained every necessary licence permit or authority that may be required in connection with the supply of Goods and Services to be carried out hereunder.

16. DEFAULT INSOLVENCY

If the Customer shall commit a breach of any of its obligations to the Company under this or any other contract or if any distress or execution shall be levied upon the Customer's property or assets or if the Customer shall make or offer any arrangement or composition with creditors or commit any act of bankruptcy or if any petition or receiving order in bankruptcy shall be presented or made against him or (being a limited company) any resolution or petition for winding up shall be passed or presented (other than for the purpose of amalgamation or reconstruction) or if a receiver or administrator of its undertaking property or assets or any part thereof shall be appointed then the Company may without notice:

(a) suspend or determine the contract or any unfulfilled part thereof; and

(b) stop any goods in transit; and (c) recover any goods from the Customer's premises for which payment has not been made in full without prejudice to any other right or remedy which the Company may lawfully enforce or exercise. Any cost incurred by the Company during the process of recovering goods from the Customer's premises for which payment has not been made in full, would be regarded as the debt of the Customer to the Company.

17. GENERAL LIEN

The Company shall have a general lien and specific lien over any goods of the Customer in its possession for any monies whatsoever due from the Customer to the Company. If any lien is not satisfied within 14 days of such monies becoming due the Company may in its absolute discretion sell the goods as agents for the Customer and apply the proceeds towards the monies due and the expenses of the sale and shall upon accounting to the Customer for the balance (if any) remaining be discharged from all liability whatsoever in respect of the goods.

18. ASSIGNMENT

The Customer shall not assign its interest in the Agreement without the written consent of the Company.



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PARTNER

