

M&C TechGroup Germany GmbH

Company Profile & Product Range.

Embracing Challenge



VERSION 1.00.00

PRESENTED BY

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►► Contents.

M&C Company Profile & Product Range.

01 M&C Overview

02 M&C Customer Industries

03 M&C Product Range

04 What's new?





01 Company Profile.

M&C Overview.



01 M&C compact.

Key Figures.

- ▶ Founded in 1985
- ▶ Worldwide established premium brand
- ▶ More than 200 employees worldwide
- ▶ Private ownership – no dependencies
- ▶ Many company and product certifications, patents and trademarks
- ▶ Core competence: gas sampling, gas conditioning, process control and special systems





01 M&C Advantages.

Some of the biggest Competitive Advantages.

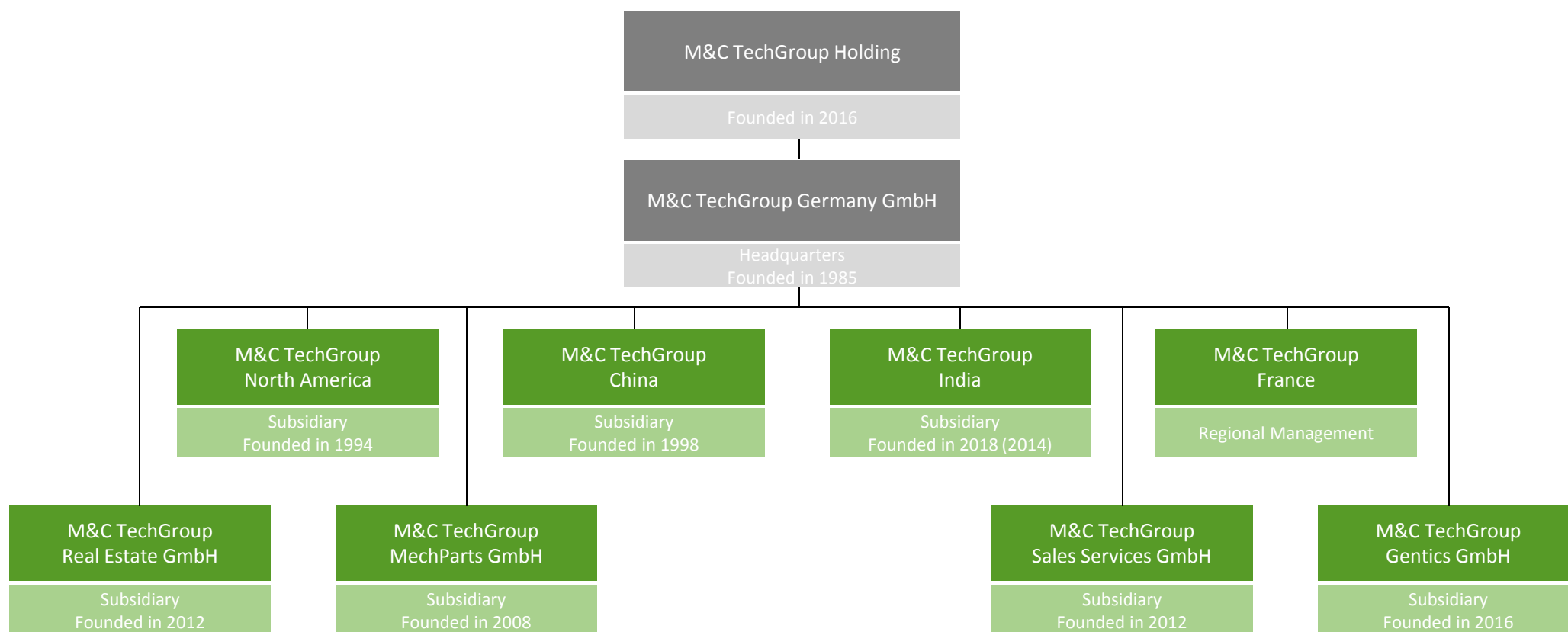
- ▶ Acting on markets worldwide, almost everywhere with own “local” staff
- ▶ High quality manufacturer of products & complete applications
- ▶ High technical competence in advising and supporting our customers
- ▶ Large number of product news & innovations
- ▶ Established brand with well-known high expertise performance





01 M&C Subsidiaries.

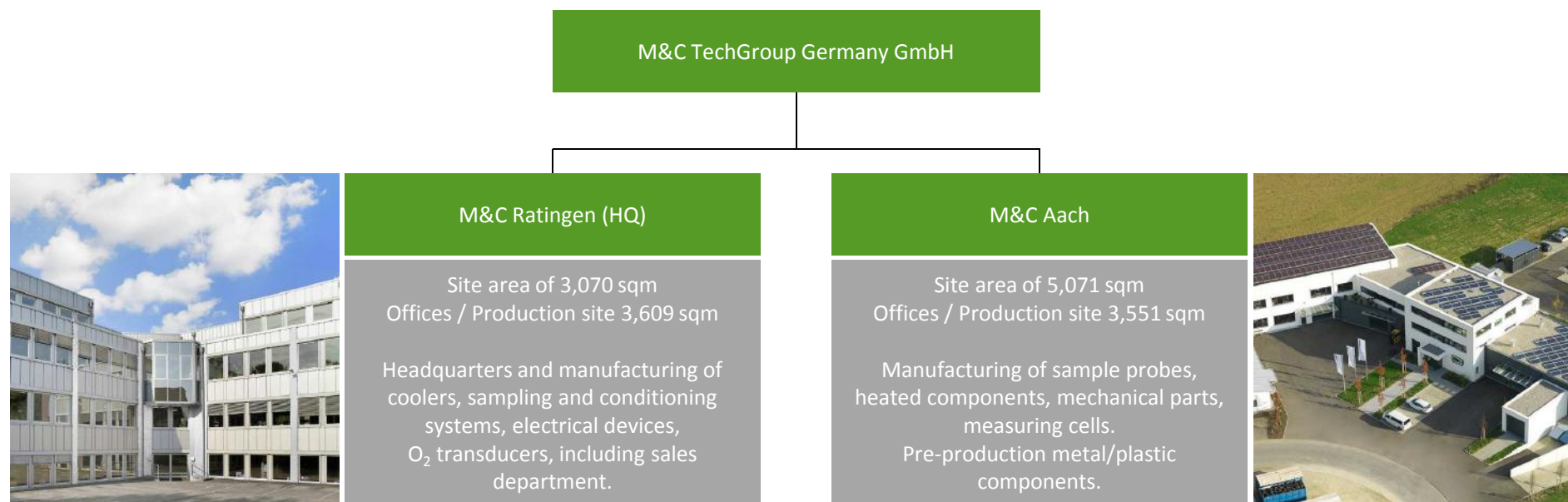
Worldwide Group Structure.





01 M&C Germany.

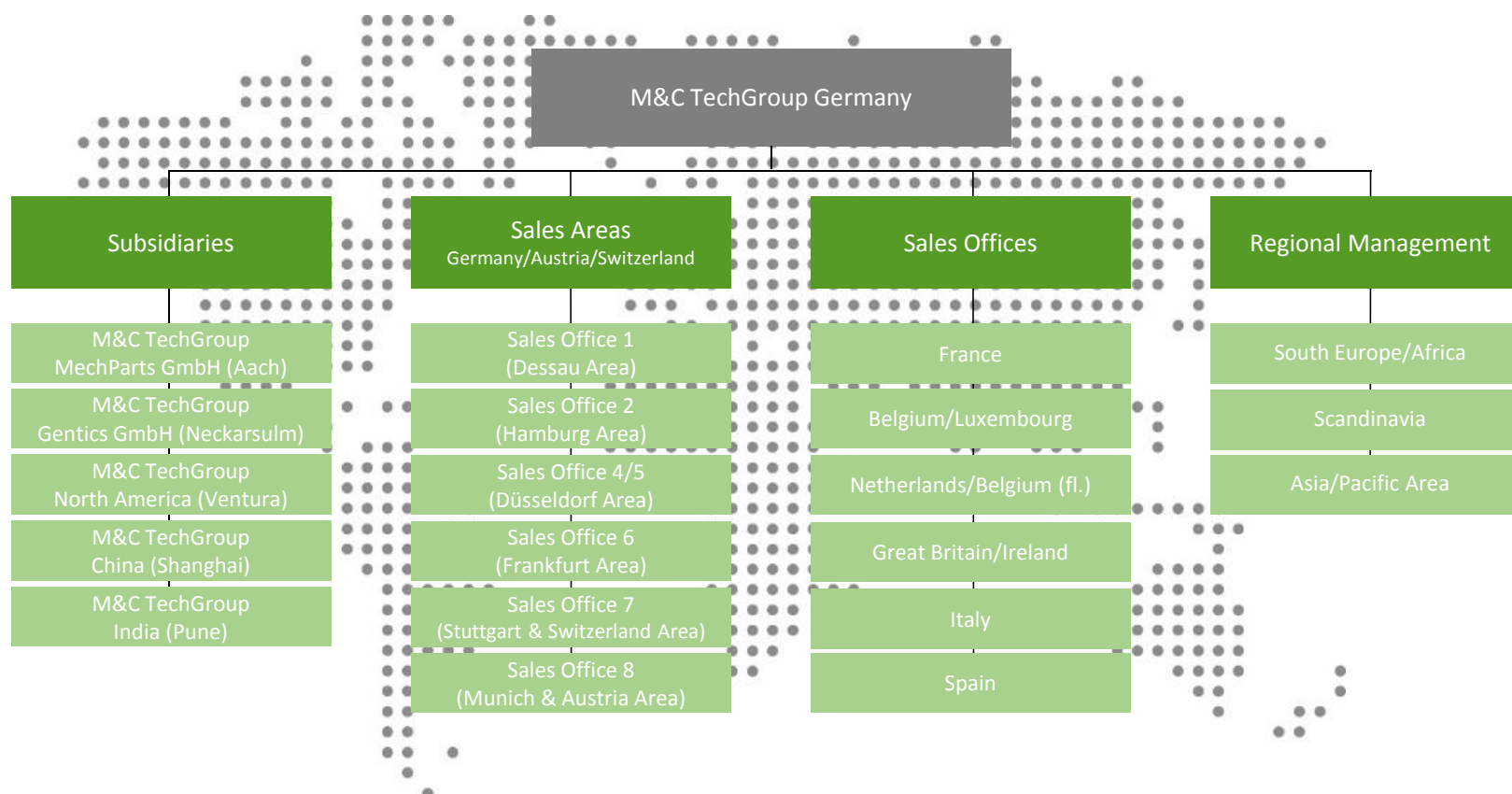
Details on M&C Locations in Germany.





01 M&C Sales Structure.

Sales Organization Overview.





02 M&C Customer Industries.

Wide Range of Customer Industries.



02 Customer Industries.

Wide Range of Customer Industries.

A _____

Aircraft and aerospace industry
Air separation plants
Aluminium industry
Automotive industry/testing stands

B _____

Beverage industry

C _____

Cement industry
Chemistry

F _____

Fermentation & brewing
Fertiliser industry
Foodstuff industry
Fuel cell industry

G _____

Glass industry

L _____

Laboratories

M _____

Metallurgy

P _____

Petro- and chlorine chemistry
Pharmaceutical industry
Power stations (coal, nuclear, gas)
Printing industry
Pulp & paper industry

S _____

Sewage treatment/waste
Ship building industry
Special operative ranges
Steel industry
Stack testing & controlling institutes

W _____

Waste incineration plants

Others.....



02 Products & Applications.

Overview.

INDUSTRY APPLICATIONS

Gas Sampling

Gas Conditioning

Paramagnetic
Oxygen Cell
Analyzer

Customized
Solutions

MANUFACTURING IN THE FIELDS OF

Emissions Control

Process Control &
Optimization

Safety

Stack Testing
(Laboratories)

On the left side of the page, there are five thick, black horizontal bars stacked vertically.

03 M&C Product Range.

Over 30 Years of Application Experience.

03 Product Range.

Over 30 Years of Application Experience.



► Probes



► Heated Lines



► Coolers



► Filters/Humidifiers



► Pumps



► Accessories



03 Product Range.

Over 30 Years of Application Experience.



► NOx Converters



► Air Generator



► O₂ Cells & Analyzers



► Conditioning Units



► Portable Components

WHAT'S
NEW?



03 Gas Sample Probes.

M&C Product Portfolio.



SP180 Series

- CEMS applications
- Self-regulating 180 °C
- Low temperature alarm
- 75 mm filter element ceramic, glass fiber, Teflon, SS
- Calibration gas included
- New insulation with special silicone (T°, UV,)
- Cost-favorable version
- Available for Ex zone 2
- Available for marine application



SP2000 Series

- CEMS & Process applications
- Controlled 180 °C
- 150 mm filter element
- Many options available
 - Teflon, Titanium
 - Calibration gas
 - Diesel/Tars filter
 - 320 °C
 - Steam-heated
 - Integrated ball valve with actuator (blowback/cal. gas)



SP2200, SP2500, SP2600

- Dusty applications (cement, steel, ...)
- Controlled 180 °C
- Filter element 140 cm² or 300 cm²
- Automatic blowback filter and/or prefilter
- Integrated isolation valve for high efficiency
- Calibration gas
- Extractable prefilter/tube
- Many options available



03 Gas Sample Probes.

M&C Product Portfolio.



SP2000-H320/S

- DeNOx (SCR) and glass applications
- Controlled 320 °C
- Against salts and crystals
- Separator vessel
- Many options available
 - Calibration gas
 - Diesel/Tars filter
 - Integrated ball valve



Dilution Series

- Dilution ratios from 10:1 up to 500:1
- Heated up to 320 °C
- Dilution probe (filter) or dilution panel
- Independent of process temperature
- Easy operation and maintenance (without tools)
- Replaceable eductor nozzles
- Dilution air preheater
- Many options available



SP3000/Ex Series

- Explosion-proof zones 1, 2, 20, 21 and 22
- Self-regulating 120 °C/140 °C
- Or controlled up to 180 °C (230 °C for Ex Zone 2)
- T° controller inside or outside the zone
- Ex certificate for the whole probe
- Many options available
 - Calibration gas
 - Automatic blowback
 - Diesel/Tars filter
 - Integrated ball valve

03 Probe Tubes/Prefilter.

M&C Product Portfolio.



Standard Tubes

- Up to 1800 °C
- Chemical/corrosion resistance
- PVDF, PTFE, SS, Kanthal, Hastelloy, Inconel, ceramic, aluminium oxide
- 2.5 m max.
- Standard G 3/4"
- Special demister tube SP32 for wet applications



Prefilters

- Dust load > 10 g/m³
- Up to 1000 °C
- Chemical/corrosion resistance
- PTFE, SS, Hastelloy, ceramic
- 1 m max.
- Extension tube if needed
- Protective plates
- Heated adapter for high T° and dust load



Heated Tubes

- To avoid condensation in the probe tube
- Up to 320 °C
- Low temperature alarm
- SS, Hastelloy
- Fix or portable
- 2 m max.
- Available for Ex zone 2
- Possibility of extension tubes or prefilters

03 Heated Lines.

M&C Product Portfolio.



Self-regulating

- 120 °C max. (65 W/m)
- Heater traced along the line
- T° depending on ambient conditions
- SS or Teflon tube
- Replaceable tube (Teflon)
- Ø 4/6 mm to 10/12 mm
- 100 m max.
- Single tube



T° controlled

- 250 °C max. (120 W/m)
- Heater coiled around the line
- T° independent of ambient conditions
- SS or Teflon tube
- Replaceable tube (Teflon)
- Ø 4/6mm to 10/12mm
- 30 m max. per circuit
- Single tube



Ex versions

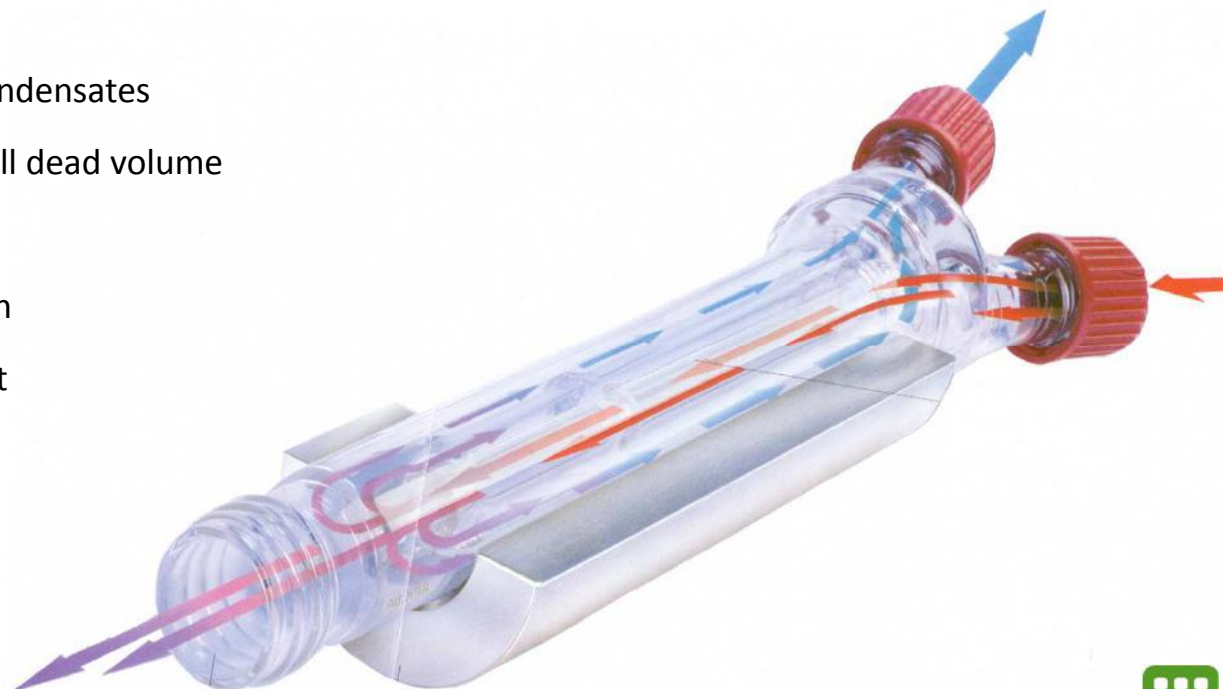
- Available for Ex zone 1
- Self-regulating up to 120 °C
- T° controlled up to 200 °C
- SS or Teflon tube
- Replaceable tube (Teflon)
- Ø 4/6mm to 8/10mm



03 Gas Coolers – Jet-Stream Technology.

Product Portfolio.

- ▶ Compact Technology
- ▶ Limited contact sample gas/condensates
- ▶ Fast response time due to small dead volume
- ▶ Optimal heat transfer
- ▶ Optimal condensate separation
- ▶ Extremely stable gas dew point
- ▶ Less washing out effect
- ▶ Improved detection limits



03 Gas Coolers.

M&C Product Portfolio.



Compressor EC Series

- Compressor coolers
- Adjustable dew point +2 °C to +7 °C
- Temperature alarm
- PVDF, PTFE, glass, SS
- 1 x 250 NI/h to 4 x 250 NI/h
- T° display
- Peristaltic pumps built in
- Options available (Pt100 for external control, fan, ...)



Deep Cooler EC30 Series

- Compressor and Peltier combination
- Dew point adjustable from -20 °C to -30 °C
- Temperature alarm
- PVDF, PTFE, glass
- 1 x 250 NI/h
- Peristaltic pumps built in
- Options available (Pt100, fan, ...)
- Application: Aerosols reduction due to acid content



Ex Series

- Compressor coolers
- Explosion-proof zones 1, 2
- Adjustable dew point +2 °C to +7 °C
- Temperature alarm
- PVDF, PTFE, glass
- 1 x 250 NI/h to 4 x 250 NI/h
- T° display
- Option: Ex peristaltic pumps

03 Gas Coolers.

M&C Product Portfolio.



VC Series

- Pre-coolers to relieve main cooling system
- Ambient air dew point
- PVDF, PTFE, glass, SS
- 1 x 250 NI/h to 2 x 250 NI/h
- Applications:
 - High humidity
 - Without heated line
 - Electrochemical cells



Peltier ECP Series

- Peltier coolers
- Adjustable dew point +2 °C to +15 °C
- Temperature alarm
- PVDF, PTFE, glass, SS
- 1 x 150 NI/h to 1 x 500 NI/h
- Options available (Pt100 for T° display, ...)



LC, LT Jacket Coolers

- Gas and liquid cooler using coiled or bundle of tubes technology
- Coolant needed (water, air, ...)
- Petrochemical & process applications
- 10 bar max.
- 700 NI/h max.
- Special requests on demand

03 Condensate Removal.

M&C Product Portfolio.



Drainers AD Series

- Automatic drainers
- Automatic drainers/separators
- High drain capacity (NI/h)
- Sample gas under pressure: 1-19 bar max.
- PVDF, PTFE, glass, SS
- SS version suitable for Ex zones 1, 2



Peristaltic Pumps SR25

- Automatic removal
- Capacity: 0.3 NI/h
- Sample gas pressure: 0.2-2.2 bar
- Suitable for Ex zones 1, 2
- Version for H₂O₂ (or equivalent) dispensing
- Options available (wall mounting, housing, acid-resistant, ...)



Vessels TG, TK

- Collecting vessels
- High resistance to corrosion
- Liquid level alarm
- Downstream cooler and/or SR25
- Pressure: 0.2-2.2 bar
- PVC, PTFE, glass, FPM
- Capacity: 1 - 10 liters

03 Filters/Humidifiers.

M&C Product Portfolio.



Universal Filters FP, FT

- Modular construction
- PVDF, PTFE, SS, ceramic
- 0.05 μm to 250 μm
- 250 bar max.
- Liquid sensor and pressure measurement possible



Heated Filters

- 350 °C max.
- PTFE, glass, ceramic, SS
- 0.05 μm to 250 μm
- 5 bar max.
- Diesel/tars filter
- Low temperature alarm



Front Panel Filters FPF

- PVC, PVDF, glass fiber
- 0.1 μm and 0.3 μm
- 4 bar max.
- Liquid sensor



Adsorption Filters FP

- Wide variety of adsorption material
- Capacity: 65 to 190 cm^3
- 5 bar max.

03 Filters/Humidifiers.

M&C Product Portfolio.



Liquid Filters FP

- Self-cleaning effect
- PVDF, PP, FPM, glass
- 70 µm and 200 µm
- 5 bar max.
- 180 NI/h max.
(bypass flow
1500 NI/h max.)



Humidifiers/Washers

- Capacity: 70 to 400 cm³
- PVDF, PTFE, glass, SS
- Optimum humidifying -
washing effect (bubbler)
- 5 bar max.



Coalescent Filters CLF

- Retention on 99.99 % for
particles > 0.1 µm
- PVDF, PTFE, glass, SS
- 26 bar max.
- Hydrophobic membrane



Liquid Stop LB-1

- Analyzer protection against
inrush of liquids
- PVDF, PTFE, glass, SS
- 10 bar max.
- Hydrophobic membrane
- Drain connection

03 Sample Pumps.

M&C Product Portfolio.



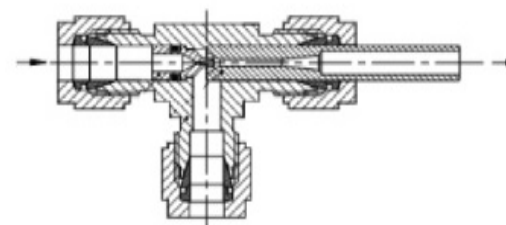
Diaphragm Pumps

- 3 NI/min to 17 NI/min
- PVDF, PTFE, Viton or all parts made of PTFE (against corrosion)
- Sample T° +80 °C max.
- Many options available
 - Housing
 - Bypass needle valve
 - Double diaphragm safety system
- Heated pump 180 °C (10 NI/min) with T° alarm
- Available for Ex zone 1



Bellows Pumps

- Bellows technique
- 5 NI/min to 10 NI/min
- All parts made of PTFE (against corrosion)
- Liquid and acid-resistant
- Bypass needle valve available
- Pump head rotation 180 °C
- 2 x Sample In and 2 x Sample Out
- Sample T° +140 °C max.
- Less maintenance
- Available for Ex zone 1



Injectors Series GIP

- 3.5 NI/min to 13.5 NI/min
- SS, glass, FPM
- Corrosion-resistant
- Sample and ambient temperature +180 °C max.
- Maintenance-free





03 Accessories.

M&C Product Portfolio.



Heated Union V...-H1

- Compact design
- Wall mounting
- SS
- 180 °C max.
- Low temperature alarm
- 200 bar max.



Heated Tee T...-H1

- Compact design
- Wall mounting
- SS
- 180 °C max.
- Low temperature alarm
- 200 bar max.



Heated Valve V3/2-H

- Wall mounting
- PTFE, SS
- 180 °C max.
- Low temperature alarm
- 30 bar max.
- Manual or electric
- Option position contact



T° Controllers

- Digital display
- Many configurations possible
- 48 x 48 mm in panel, rail or wall mounting
- Option SSR included



03 Accessories.

M&C Product Portfolio.



Flow Meters FM

- 16 NI/h to 800 NI/h
- Wall or panel mounting
- PVDF, PTFE, PEEK, SS, glass
- With needle valve
- Sample T° +150 °C max.
- Heated version 180 °C with T° and flow alarm



Flow Detections FA

- Optical technology
- Mono or Bi-stable
- Easy mounting and adjustment
- Electronic is needed



Liquid Sensors LA, KS

- Conductivity technology
- For conductive and non-conductive media
- 100 bar max.
- Installation on a filter or flow chamber
- Electronic is needed



Electronic Controllers

- For flow and liquid sensors
- Wall or rail mounting
- Easy adjustment of the sensitivity
- Alarm contact and LEDs for display
- 24 V DC, 115 and 230 V AC

03 Accessories.

M&C Product Portfolio.



Valves

- Ball valves L/PV
 - PVDF 2-ways to 5-ways
 - 10 bar max.
 - Position contact
- Needle valves RV 11
 - PVDF, PTFE, PEEK
 - 150 °C max.
 - 4 bar max.



GL Connectors

- PDVF Adapters 4/6 mm to 10/12 mm
- Union sealing rings
- Adjustable couplings
- Corrosion -resistant



Standard Connectors

- For hoses and tubes
- PP, PVDF, PTFE, SS
- 4/6 mm to 10/12 mm
- Gas and NPT threads
- Ferrules and nuts
- Corrosion-resistant



Tubing

- PVDF, PTFE, FPM, PFA, Novoprene, PA, PE
- 4/6 mm to 10/12 mm
- 200 °C max.
- 11 bar max.
- Corrosion and UV-resistant

03 NOx Converters/Air Generator.

M&C Product Portfolio.



NOx Converters CG-2

- With 2 types of catalysts (C or SS) for higher conversion efficiency (> 95% with new catalyst)
- T° oven: 350 °C or 660 °C
- Low temperature alarm
- 19" or wall mounting
- Easy catalyst replacement
- Options available
 - Catalyst bypass with solenoid valves
 - Complete heated version for 'hot' systems and in case of high NO₂ content



Air Generator BA

- Supply of 4 bar and 3 NI/min max. of air (adjustable)
- Air quality:
 - CnHm < 10 ppb
 - Dew point < -10 °C
 - Dust and oil-free
- Status alarm
- Possibility of internal compressor
- Easy catalysts replacement



03 O₂ Analyzers.

M&C Product Portfolio.



Paramagnetic Oxygen Transmitter/Analyzers

- Using the Magneto-dynamic technology
- Small dead volume (2 ml) for faster response time
- Low drift and low cross-sensitivity against other components
- Most selective and reliable method for O₂ measuring in a linear range of 0 to 100 % vol.
- High resistance against corrosion
- Different materials available (e.g. cell for chlorine application)
- No maintenance or replacement of the cell when used correctly
- Analog output and status alarm
- Possibility of single transmitter type PMA05
- Universal Touch Screen interface/Intuitive graphic user interface similar to smartphones
- Available for Ex zone 1/EN 14181 for the portable version/SIL EN 61508



03 Conditioning Units.

M&C Product Portfolio.



Unit CSS-M Series

- 1 x 70 NI/h
- Wall mounting or portable versions
- Including:
 - Peltier cooler (+2 to +15 °C)
 - Peristaltic pump
 - Panel filter with liquid alarm
 - Sample pump
 - Flow meter with needle valve



Unit SS-5 Series

- 1 x 150 NI/h or 1 x 350 NI/h
- Wall mounting
- Including:
 - Peltier cooler (+2 to +15 °C)
 - Peristaltic pump
 - Universal filter
 - Sample pump
- Options available: T° controller, flow meters with needle valve, liquid alarm ...



Unit CSS-V & VC Series

- Configurable
- 1 x 250 NI/h or 2 x 150 NI/h
- 19" or Wall mounting
- With compressor cooler ECM
- Possibilities:
 - Peristaltic pumps
 - Filters with liquid alarm
 - Sample pumps
 - Flow meters with needle valve
 - Dispensing pumps



03 Conditioning Units.

M&C Product Portfolio.



Heated Housing PAS Series

- For heated sampling
- T° adjustable +20 to +200 °C with digital display
- Low temperature alarm
- Dimensions (W x H x D): 320 x 240 x 175 mm up to 560 x 480 x 400 mm
- Mounting of customized components (FTIR, heated analyzers, chromatographs ...)
- Available for Ex zone 2
- Wall mounting
- Options available: front window, T° limiter, external control, wall bushings for heated lines ...



Washing & Stripping Columns

- Gas measurement contained in liquid sample (e.g. waste water)
- With pressure regulator and flow meters
- PVDF, PTFE, SS
- Automatic sample level
- Purge valve
- Available as washing unit to remove acids

03 Portable Components.

M&C Product Portfolio.



Heated Probe

- Laboratories, Stack Testing Companies (spot measurements)
- - Controlled at 100-180 °C
- 75 mm filter element
- Compact, light and easy to handle
- Many options available
 - calibration gas
 - T° measurement
 - Filter elements
 - Tubes and prefilters
 - Heated lines



Heated Line

- 200 °C max. (110 W/m)
- Replaceable Teflon tube
- Ø 4/6 mm to 10/12 mm
- Easy connection on the probe PSP4000-H and conditioning unit PSS
- Option for one power supply (PSP4000 + HSL + PSS-5)



Conditioning Unit

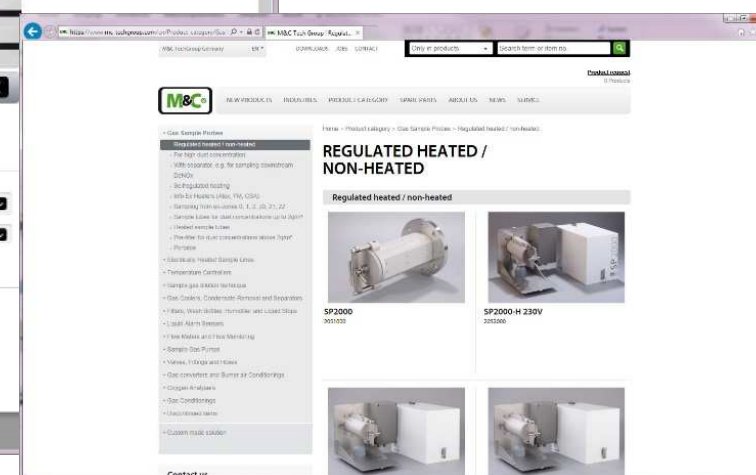
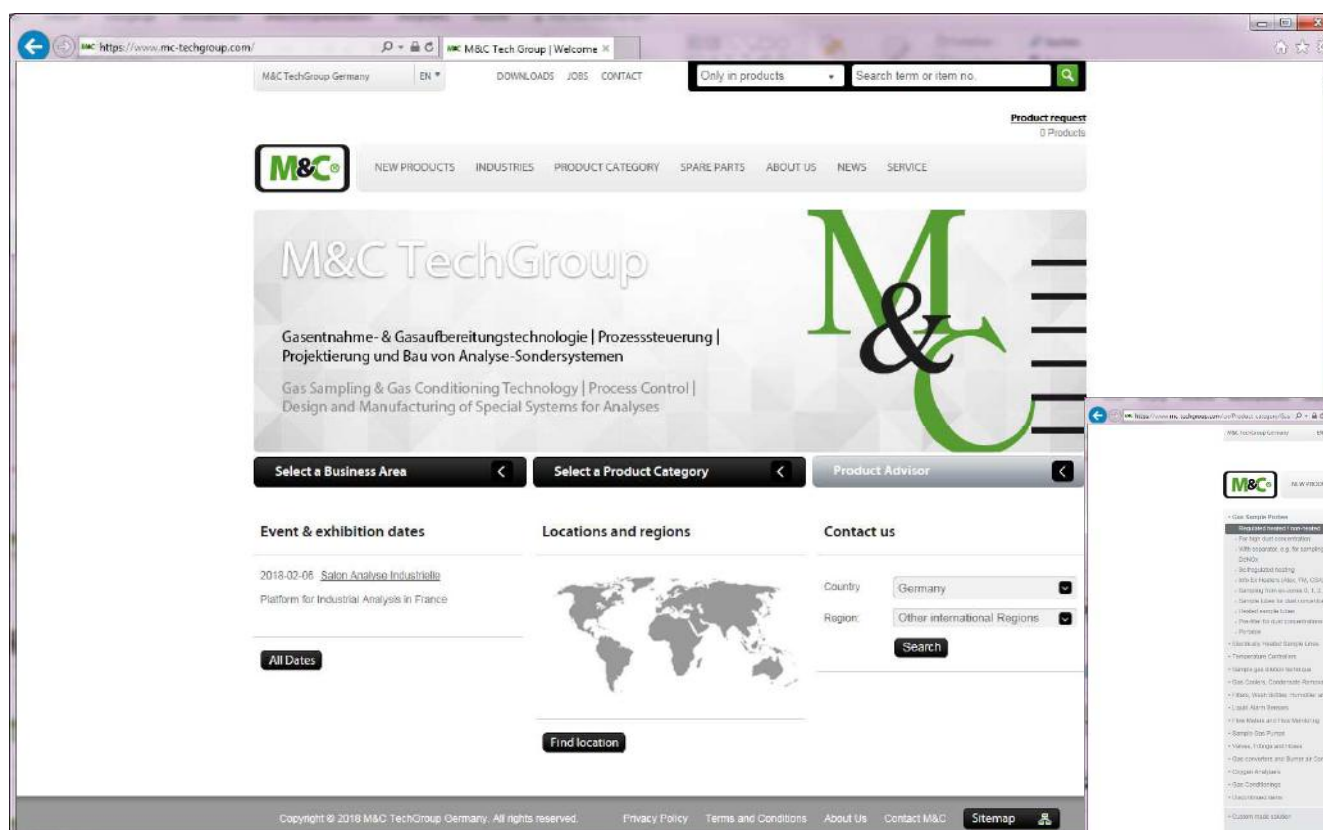
- 70 NI/h to 480 NI/h
- Self-monitoring and low maintenance
- Including:
 - Peltier or compressor cooler
 - Peristaltic pump
 - Universal filter
 - Sample pump
- Options : T° controller, flow meters, liquid alarm, coalescent filter ...
- Customized units





03 M&C Website.

All Products and Spare Parts are listed on our Website.





04 What's new?

Development based on market requirements.



04 What's new?

Development Based on Market Requirements.

- + NEW CERTIFICATIONS FOR MARITIME & EX ZONE 2
- + AIROPTIC LASER SALES CONTRACT SIGNED
- + NEW EX BELLOWS PUMPS OF THE MP-F SERIES
- + ULTRA-LOW GAS COOLER EC-30C



04 What's new?

New Certifications for Maritime & Ex Zone 2.

- ▶ Marine application or Ex zone 2
- ▶ Gas sampling from dusty processes
- ▶ Low volume, quick response time
- ▶ Simple mounting and service
- ▶ Self-regulating electrical heating
- ▶ Low-temperature alarm contact
- ▶ Outside mounting possible due to newly constructed insulated cover
- ▶ Connection for test gas according to EN14181 enabling calibration through the filter included as standard
- ▶ Options for mounting sample tubes



04 What's new?

New Ex Bellows Pumps of the MP-F Series.

- ▶ Sample gas flow 5 to 10 NI/min
- ▶ Reliability bellows pumps > Diaphragm pumps
- ▶ All parts made of PTFE
- ▶ High resistance to corrosion and liquids
- ▶ Installation downstream/upstream gas cooler
- ▶ Pump head rotates 360 °C
- ▶ 2 Sample gas In / Out
- ▶ 115 VAC or 230 VAC
- ▶ Low level and cost-favorable maintenance
- ▶ Explosion-proof version available





04 What's new?

Ultra-Low Gas Cooler EC-30C.

- ▶ Follow-up model of M&C's EC30
- ▶ Cooling capacity 130 kJ/h at maximum allowed ambient temperature of 45 °C (113 °F)
- ▶ 250 NI/h max. sample gas flow rate
- ▶ Water vapour dew point input up to +70 °C (+158 °F)
- ▶ Dew point output can be set from -20 °C to -30 °C (~-4 °F to ~-22 °F)
- ▶ Dew point output stability ± 0.1 °C (± 0.18 °F)
- ▶ 24/7 operation
- ▶ Icon-based graphical display for easy and intuitive navigation
- ▶ Safe operation guaranteed by self-monitoring and pre-warning messages to inform about upcoming maintenance work



Embracing Challenge



THANK YOU
FOR LISTENING!