



TechGroup

Instruction Manual

Air Conditioning Unit Series BA Version BA-C



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Dear customer,

we have made up this operating manual in such a way that all necessary information about the product can be found and understood quickly and easily.

Should you still have any question, please do not hesitate to contact **M&C** directly or go through your appointed dealer. Respective contact addresses are to be found in the annexe to this operating manual.

Please also contact our homepage www.mc-techgroup.com for further information about our products. There, you can read or download the data sheets and operating manuals of all **M&C** products as well as further information in German, English and French.

This Operating Manual does not claim completeness and may be subject to technical modifications.

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1 GENERAL INFORMATION

The product described in this operating manual has been examined before delivery and left our works in perfect condition related to safety regulations. In order to keep this condition and to guarantee a safe operation, it is important to heed the notes and prescriptions made in this operating manual. Furthermore, attention must be paid to appropriate transportation, correct storage, as well as professional installation and maintenance work.

All necessary information a skilled staff will need for appropriate use of this product are given in this operating manual.

2 DECLARATION OF CONFORMITY



The product described in this operating manual complies with the following EC directives:

EMV-Instruction

The requirements of the EC directive 2004/108/EC "Electromagnetic compatibility" are met.

Low Voltage Directive

The requirement of the EC directive 2006/95/EC "Low Voltage Directive" are met.
The compliance with this EC directive has been examined according to DIN EN 61010.

Declaration of conformity

The EU Declaration of conformity can be downloaded from the **M&C** homepage or directly requested from **M&C**.

3 SAFETY INSTRUCTIONS

Please take care of the following basic safety procedures when mounting, starting up or operating this equipment:

Read this operating manual before starting up and use of the equipment. The information and warnings given in this operating manual must be heeded.

Any work on electrical equipment is only to be carried out by trained specialists as per the regulations currently in force.

Attention must be paid to the requirements of VDE 0100 (IEC 364) when setting high-power electrical units with nominal voltages of up to 1000 V, together with the associated standards and stipulations.

Check the details on the type plate to ensure that the equipment is connected to the correct mains voltage.

Protection against touching dangerously high electrical voltages:

Before opening the equipment, it must be switched off and hold no voltages. This also applies to any external control circuits that are connected.

The device is only to be used within the permitted range of temperatures and pressures.

Check that the location is weather-protected. It should not be subject to either direct rain or moisture.

The air conditioning unit BA-C must not be used in hazardous areas.

Installation, maintenance, monitoring and any repairs may only be done by authorized personnel with respect to the relevant stipulations.

4 WARRANTY

If the equipment fails, please contact **M&C** directly or else go through your **M&C** authorised dealer. We offer a one year warranty as of the day of delivery as per our normal terms and conditions of sale, and assuming technically correct operation of the unit. Consumables are hereby excluded. The terms of the warranty cover repair at the factory at no cost or the replacement at no cost of the equipment free ex user location. Reshipments must be send in a sufficient and proper protective packaging.

5 USED TERMS AND SIGNAL INDICATIONS



DANGER!

This means that death, severe physical injuries and/or important material damages **will occur** in case the respective safety measures are not fulfilled.



WARNING!

This means that death, severe physical injuries and/or important material damages **may occur** in case the respective safety measures are not fulfilled.



CARE!

This means that minor physical injuries **may occur** in case the respective safety measures are not fulfilled.

CARE!

Without the warning triangle means that a material damage may occur in case the respective safety measures are not met.

ATTENTION!

This means that an unintentional situation or an unintentional status may occur in case the respective note is not respected.



NOTE!

These are important information about the product or parts of the operating manual which require user's attention.

SKILLED STAFF

These are persons with necessary qualification who are familiar with installation, use and maintenance of the product.

6 INTRODUCTION

The **M&C BA-C** air conditioning unit has been designed especially for applications where dry, cleaned and hydrocarbon-free air is required, independent of gas cylinders.

Typical applications are hydrocarbon measurements with flame ionisation detectors (FID) and use as a zero gas generator for the calibration of infrared (IR) analyzers or for production of dilution gas for **M&C** dilution probes.

The **M&C BA-C** air conditioning units are compact, operator and service-friendly 19" plug-in units for 19"-rack mounting or wall mounting.

7 FUNCTION

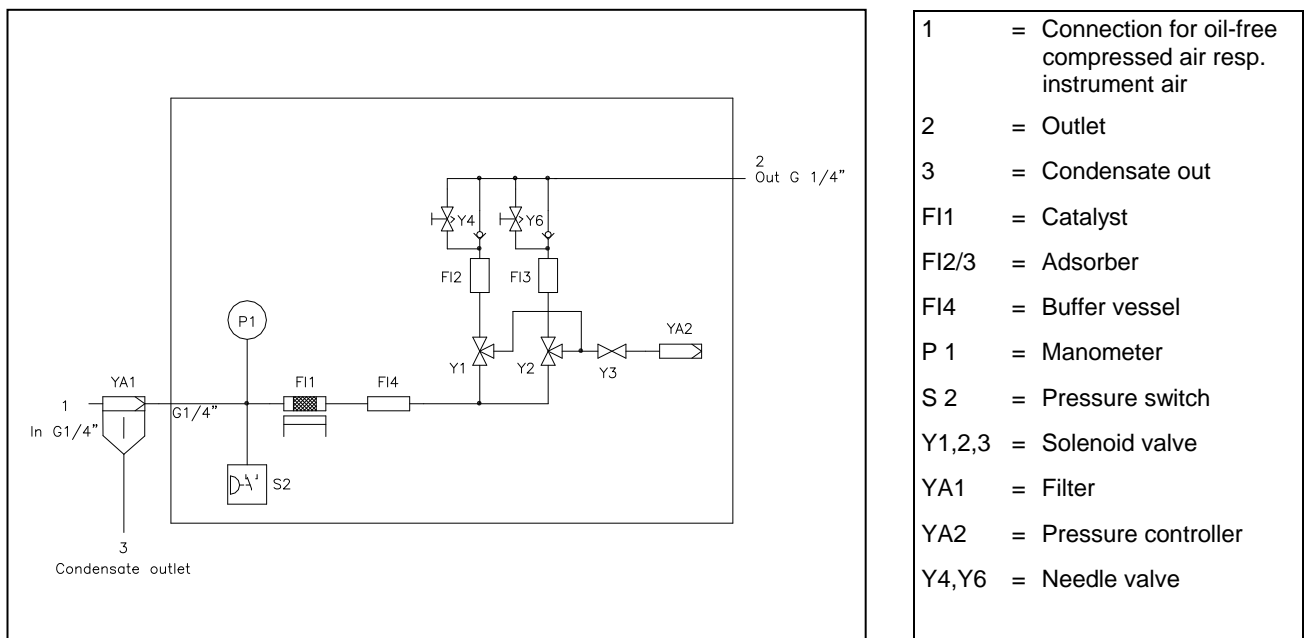


Figure 1 Function diagram of BA-C air conditioning units

The functional principle of the M&C combustion air conditioning unit is divided into two sections (see Figure 1):

- Hydrocarbon elimination section
- Gas conditioning section

Hydrocarbon elimination section:

Catalytic oxidation **F1** of hydrocarbons at a temperature of 932°F at the surface of the platinum/palladium filling. The optimum catalyst temperature is adjusted ex works at the temperature controller B1 of the air conditioning unit.

Gas conditioning section:

The second cleaning stage are two mol sieve columns removing CO₂ and moisture (**FI2** and **FI3**) being switched and purged resp. regenerated cyclical.

The inlet pressure is 70 - 145 psig. The manometer **P1** on the front plate of the **BA-C** enables the optical control of the inlet pressure.

The cleaned air is available at the outlet **2**. Here a connector G ¼" i provided by customer can be mounted.

If the inlet pressure drops to a value below 73 psi or the catalyst temperature falls below 914°F the gas flow is switched off.

8 TECHNICAL DATA

Combustion Air Conditioning Unit	Type BA-C 230V	Type BA-C 115V
Part No.:	60 A 2000	60 A 2200
Inlet pressure	Instr. air 73 psi up to 145 psi	
Flow rate air	maximum 15 NI/min	
Ambient temperature	+41°C to +104°F	
Ready for operation	approx. 15 min.	
Catalyst	Platinum/Paladium on Al ₂ O ₃ -Support	
Temperature of catalyst	932°F	
Contamination of catalyst	Halogene, silicon, lead, phosphoric substances	
Adsorber	Molecular sieve	
Purity of air	< 2 ppm CO ₂	
Storage temperature	-13°C to +149°C	
Relative humidity	< 75 % avoid condensation	
Gas connection 'Inlet'	G1/4"i	
Gas connection 'Outlet'	G1/4"i	
Power supply / Power consumption	230V 48-62 Hz 560VA	115V 48-62 Hz 150VA
Electrical connection	Mains cable 3x 1,5 ² 3 m length with cable end contact Status cable 2x 0,75 ² 3m length with cable end contact	
Electrical protection	1 x 4A _T	
Status contact output for pressure and temperature	1 NO contact - potential free, max . 24V, 1A	
Protection	IP 20 (EN 60529)	
Dimensions	19" housing 6 U (HE), depth 375 mm	
Weight	24,5 kg	
Colour of front plate	Ral 7035	
Noise	Approx. 70db(A) cyclic 5min	
Electrical equipment standard	EN 60204-1, EN 57721	

9 DESCRIPTION

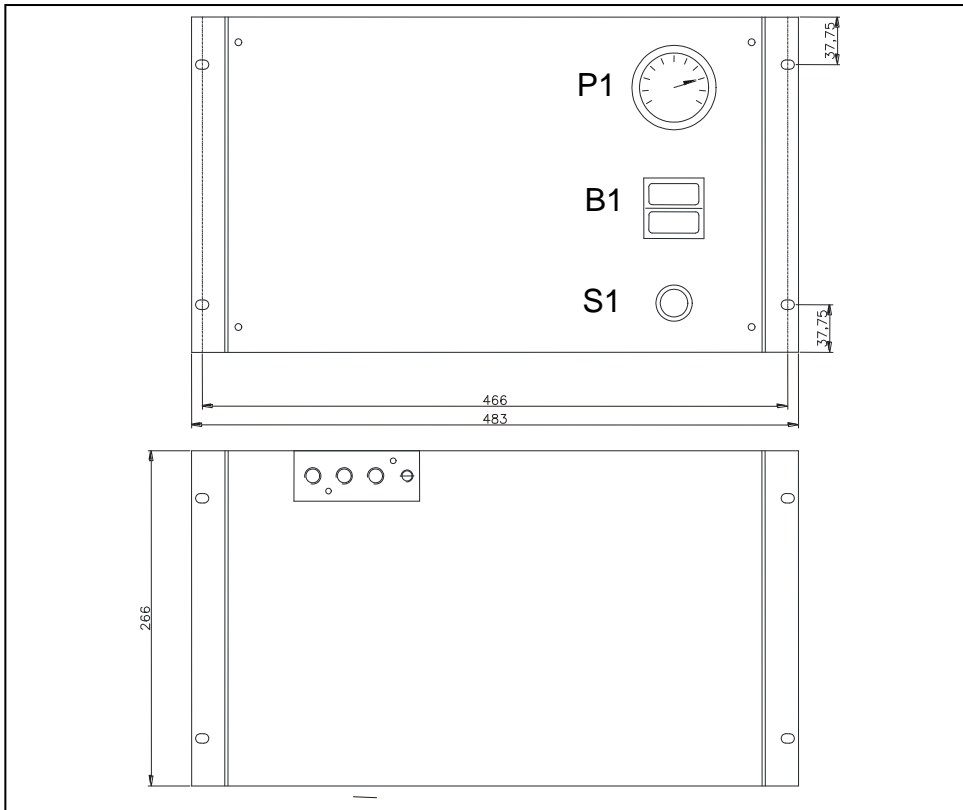


Figure 2 BA-C air conditioning unit

All controls and indicating elements are arranged easily accessible on the front panel of the combustion air conditioning unit:

P1: Inlet pressure gauge **P1**

S1: Main switch **S1**

B1: Temperature controller with digital temperature display **B1**

The **M&C** air conditioning unit **BA-C** is a compact, easy to handle and maintain wall mounting device. By rebuilding the mounting brackets the air conditioning unit is also applicable for 19"-rack mounting. The gas connections at the back (G 1/4"i) can be used for the 19"-mounting and the gas connections on the top can be used for wall mounting. The electrical connections take place via the fix connected 3m cable at the side of the housing.

The oven temperature is electronically controlled and preset at the factory to +932 °F at the temperature controller **B1** on the front panel.

Remaining the catalyst temperature by 50 °F or the minimum inlet pressure of 73 psi will switch of the gas flow.

10 RECEIPT AND STORAGE

The **BA-C** combustion air conditioning unit is a complete, pre-installed unit. The standard catalyst and adsorber cartridge supplied is already fitted. The filter to be connected upstream is attached to the device.

- Immediately remove the air conditioning unit and any special accessories carefully from the packaging and check the contents against the delivery note.
- Inspect the unit for possible transport damage and inform the transport insurer concerned immediately if any damage is noticed.



NOTE!

The air conditioning unit should be stored protected from frost!

11 INSTALLATION NOTES



NOTE!

The air conditioning unit must only be used in the conditions specified in the technical data.

The air conditioning unit should be installed away from heat sources and freely ventilated to prevent any accumulation of heat.

For outdoor installation, the air conditioning unit must be installed in a housing protected from frost in the winter and sufficiently ventilated in summer. Exposure to direct sunlight must be avoided.

At the inlet of the device (upstream the filter) a shut off valve shall be provided

11.1 REBUILDING FOR 19"-RACK-MOUNTING

The delivered device is prepared for wall mounting.

For 19"-rack-mounting the two mounting brackets have to be disconnected from the back side and fixed to the front side.

For one side as a start act as follows:

- Unscrew the three screws at the front of the sidewall.
- Unscrew the two upper screws at the mounting bracket and only loosen the third to turn the bracket to the back. Screw in now the two screws again.
- Unscrew the lower screw from the bracket and screw it in without the bracket.
- Fix the bracket at the front.

Do it the same way at the other side.

This procedure ensures that the back wall remains fixed in the device.

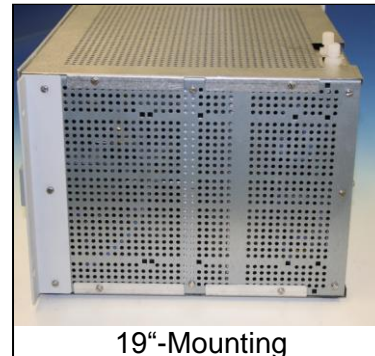
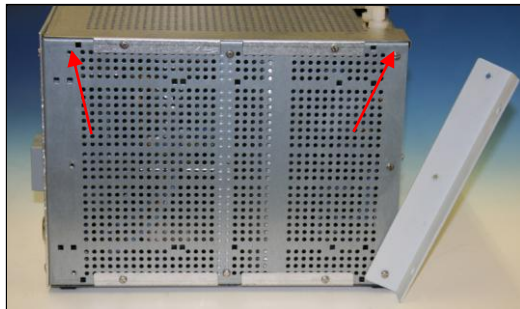


Figure 3 Rebuilding the mounting brackets

12 SUPPLY CONNECTIONS

12.1 MOUNTING AND CONNECTION OF THE FILTER

The separate delivered filter has to be mounted at an easy accessible place and has to be connected with the inlet of the air conditioning unit. For the filter housing a minimum constructional size of 100mm has to be taken into consideration.

For the connection between filter and the inlet of the conditioning unit two connectors G ¼"-DN4/6 and 2m PTFE tube are enclosed to the delivery. The filter inlet is marked with 1 and the outlet is marked with 2.



WARNING!

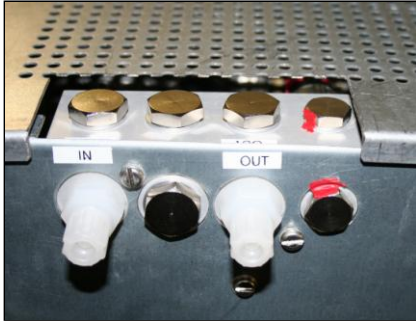
The input compressed air has to be dry and oil free, because otherwise the device will be damaged!



12.2 HOSE CONNECTIONS

The connection of the air in- and outlet take place on the top for wall mounting and at the back side for 19"-rack-mounting.

19"-Mounting



Wall mounting



Figure 4 Hose connections for wall mounting or 19"-rack-mounting

For rebuilding the connections (G1/4"i) on the top or back side the blind plugs have to be displaced correspondingly.



HINWEIS!

Do not exchange the tube connections for inlet and outlet; the connections are marked correspondingly.
1 = inlet; 2 = outlet

After connecting all tubings, check the closeness.

— Appropriate connection fittings are optionally available by M&C

12.3 ELECTRICAL CONNECTIONS



WARNING!

Incorrect system voltage can damage the unit. When establishing connections, check that the system voltage corresponds with the voltage shown on the type plate!



NOTE!

For the erection of power installations with rated voltages up to 1000V, the requirements of VDE 0100 and relevant standards and specifications must be observed!

The main circuit is equipped with a fuse corresponding to the nominal current (over current protection); for electrical details see technical data.

The mains connection takes place via the fixed installed 3m mains cable:

brown = L
blue = N
green/yellow = PE

The connection of the status alarm NO takes place via the fixed installed 3m twin core cable.

13 INITIAL OPERATION

Prior to initial operation, the system and process-specific safety measures must be observed !

The following steps must be carried out prior to initial operation:

- Prior to initial operation, compare the system voltage with the voltage shown on the rating plate;
- Connect the air conditioning unit to the mains;
- Connect status contact output, if necessary ;
- Operate the “**Power/On**” switch (green LED lights).
- Check the nominal temperature of 500°C at the temperature controller (see Figure 2).
- When operational readiness has been reached (about 15 minutes), the 1 lights up in the display.



WARNING!

The air conditioning unit is operated with min. 73 psi and max. 145 psi inlet pressure.



NOTE!

The maximum gas flow is 15NI/min.

14 SWITCH OFF



NOTE!

The place of installation of the air conditioning unit must be remain free from frost also during time when the unit is switched off !

Switch off the device and disconnect the pressure air.
No more particular measures are required for switch off.

15 MAINTENANCE

Before carrying out maintenance work, the system and process-specific safety measures must be observed!



WARNING!

The air conditioning is operated with max. 145 psi inlet pressure. High voltage and high pressure. Disconnect the mains plug and the pressure air inlet before opening the housing!



**WARNING!**

Also after switching off the mains voltage touching the catalyst cartridge can lead to serious burns. Wear protective gloves.



15.1 THE EXTERNAL PARTICLE-CONDENSATE-FILTER

**WARNING!**

The air conditioning is operated with max. 145 psi inlet pressure. Before maintaining the filter the device has to be disconnected from the pressure air.

**WARNING!**

At a condensate level of 10mm below the Filterelement (see marking) the condensate has to be drained because otherwise the air conditioning will be damaged.

15.1.1 DRAIN OF THE CONDENSATE

- Disconnect the device from the pressure air supply.
- Open drain screw anti clockwise seen from below.
- Condensate is draining off.

For the condensate connection a hose connector for tube 4/6mm is existing.

15.1.2 CHANGE OF THE FILTER CARTRIDGE

Changing the filter cartridge may be necessary in case of decreasing air flow.

For a change of the filter cartridge the following steps must be carried out:

- Disconnect pressure air from the filter
- Wait until the pressure in the device has decreased to ambient pressure (control at the manometer)
- Push unlock slider in direction of the arrow
- Turn filter housing anti clockwise (seen from below) and remove it downwards
- Turn filter cartridge anti clockwise
- Touch new filter cartridge only at the lower end
- Mount the parts in reverse order

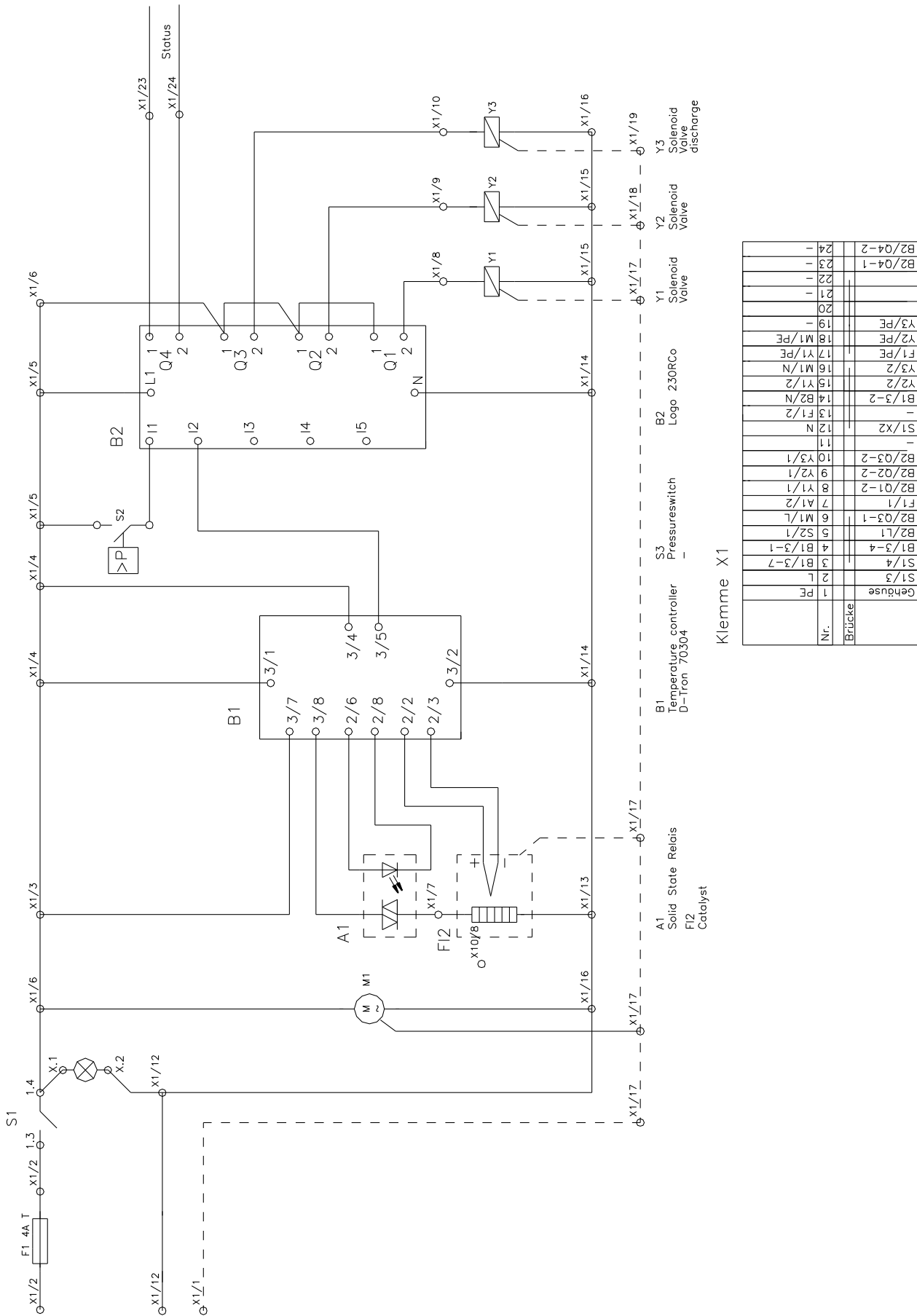


16 APPENDIX

- Circuit diagram BA-C



More product documentation is available on our Internet catalogue:
www.mc-techgroup.com



Klemme X1

Nr.	
Brücke	
1	PE
2	L
3	B1/3-7
4	B1/3-1
5	S2/1
6	M1/L
7	A1/2
8	Y1/1
9	Y2/1
10	Y3/1
11	-
12	N
13	F1/2
14	B2/N
15	Y1/2
16	M1/N
17	F1/PE
18	M1/PE
19	-
20	-
21	-
22	-
23	-
24	B2/04-2

Figure 5 Circuit diagram BA-C