Embracing Challenge

Electrically Heated Ball and Solenoid Valve Series

V3/2-H, V3/2-H/PE, V3/2-H/EA, MV3/2-H, MV3/2-H

Instruction Manual
Version 1.00.01

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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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Version: 1.00.01

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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

CE - Certification

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

EMV-Instruction

The requirements of the EU directive 2014/30/EU “Electromagnetic compatibility“ are met.

Low Voltage Directive

The requirement of the EU directive 2014/35/EU “Low Voltage Directive“ are met.
The compliance with this EU 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 device 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** electrically heated 3/2-way ball valves type **V3/2-H…** as well as the solenoid valve **MV3/2-H** are used in heated analysis systems to switch between the following functions:

- sample gas to the analyser(s),
- calibration gas to the analyser(s) or
- two sample streams to a common outlet.

6.1 Serial numbers

The nameplates with the serial number are located on the mounting plate of the heated valve.

NOTE! **The gas conditioning system should be stored in a protected frost-free area !**

6.2 Power supply

The power supply for the heater of all types of heated valves is 230 V 50Hz or 115V 60Hz.
In case of type **MV3/2-H** the solenoid valve is powered by $24V_{DC}$.

7 TECHNICAL DATA

3/2-Way Valves	**V3/2-H**	**V3/2-H/PE**	**MV3/2-H**
Part number	03V3000 (a)	03V3010 (a)	03V2000 (a)
Position identification	no	yes	no
Nominal width / C_v	DN7 / 1,7		DN4 / 0,4
Operating pressure	max. 30bar		max. 2bar
Sample gas temperature	max. +180°C		
Ambient temperature	-25°C to +60°C		
Storage temperature	-25°C to +80°C		
Gas connections	Tube connectors Ø 6mm, optional Ø ¼" type Swagelok®		
Temperature controller	Capillary thermostat with high temperature limiter and low temperature alarm; integrated in electrical connection box		
Operating temperature	0°C – 180°C (set at factory) adjustable		
Dial thermometer	Range 50°C – 250°C		
Temperature alarm	Alarm point ΔT -30°C to T_{set}		
Contact rating	Voltage free change-over contact, 250V 3A~, 0,25A=		
Position identification		Voltage free change-over contact, 250V_{AC} 1A	
Power supply	230V 50Hz, 115V 60Hz (a)		
Power supply solenoid valve			24V_{DC} 15W
Power consumption	350VA		
Electrical connections	Terminals 4mm² 2 x PG13	Terminals 4mm², 3 x PG13	
Protection / Electrical standard	IP54 (EN 60529) / EN 61010, EN 60519-1		
Dimensions (wxhxd) /	350x320x150mm		350x320x150mm
Weight	7,5kg		8kg
Dead volume	approx. 5cm³		
Materials of sample wetted parts	Stainless steel 316Ti, PTFE		Stainless steel 316Ti, FPM, FFKM
Mounting	Wall mounting		

8 APPLICATIONS

In analysis technique, often temperatures must be kept above the sample gas dew point. Therefore, it is absolutely necessary to avoid cold spots. In order to ensure this, the temperature regulated **M&C** three-way valves **V3/2-H…** and **MV3/2 H** are used for the cut-off or switching-over of sample gases and test gases up to an operating temperature of 180 °C.

9 DESCRIPTION

The **M&C** electrically heated valves are fixed on a mounting plate, decoupled from heat and covered with an insulated enclosure. The heater consists of a heating element with high capacity. The temperature is adjustable on the integrated thermostat up to 180 °C with high temperature limiter and low temperature alarm. The heat insulated enclosure with a bushing for the dial thermometer is equipped with quick acting bentlever closures. The connection box with integrated thermostat is installed outside the enclosure on the mounting plate. Version **V3/2-H/PE** has got an additional connecting box for the contact output of the position identification. The power supply for the solenoid valves version **MV3/2-H** is 24V DC and the additional connecting box is installed on the mounting plate. In order to prevent cold spots, the connecting fittings are heated by means of thermal conducting jaws. The electrically heated sample lines type **3/4/5-N/M/H** are fixed with mounting brackets.

10 RECEIPT OF GOODS AND STORAGE

- Please take the heated valve and possible special accessories carefully out of the packaging material immediately after arrival, and compare the goods with the items listed on the delivery note!
- Check the goods for any damage caused during delivery and, if necessary, notify your transport insurance company without delay of any damage discovered.

NOTE!

The equipment should be stored in a protected, frost-free room!

11 PREPARATION AND INSTALLATION

Locate the heated 3-way-valves type **V3/2-H…** and **MV3/2-H** in such a way that there is adequate space for removing the cover and connecting the sample lines. Fix the aluminium plate with 4 screws.
Make certain that the heated 3-way-valves are easily accessible so that you can carry out any subsequent maintenance work without trouble.

12 MOUNTING

- Loosen the four clamps on top and at the bottom.
- Remove the cover of the heated 3-way-valve type **V3/2-H…** and **MV3/2-H**.
- Remove the aluminium lid by loosening the two screws.
- Connect the sample lines to the fittings.

NOTE!

Make sure that the connection is leak proof!

- Put the aluminium lid back again and screw it.
- Put the cover of the heated 3-way-valve on top again and close the clamping devices.

13 ELECTRICAL CONNECTION

WARNING!

When connecting the equipment, please ensure that the supply voltage is identical with the information provided on the type plate.

NOTE!

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

A main switch and matching fuse must be provided externally!

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

- Remove the lid of the electrical connection box. The electrical connection layout is located in the lid. Insert the mains cable (min. 3 x 1.5 mm²) through the cable gland and connect to the appropriate terminals.
- Insert the signal cable through the cable gland and connect to the appropriate terminals. Screw lid back on.

14 STARTING

WARNING!

Before starting up the equipment, please ensure that the supply voltage is identical with the information provided on the type plate.

Before starting up check whether the mains power supply voltage corresponds with the information stated on the valves type plate.

Switch on mains power supply.

The total heating-up time is approximately 30 min. The heated 3-way-valves type **V3/2-H…** and **MV3/2-H** are then ready for operation

15 MAINTENANCE

No special maintenance necessary.

16 SPARE PART LIST

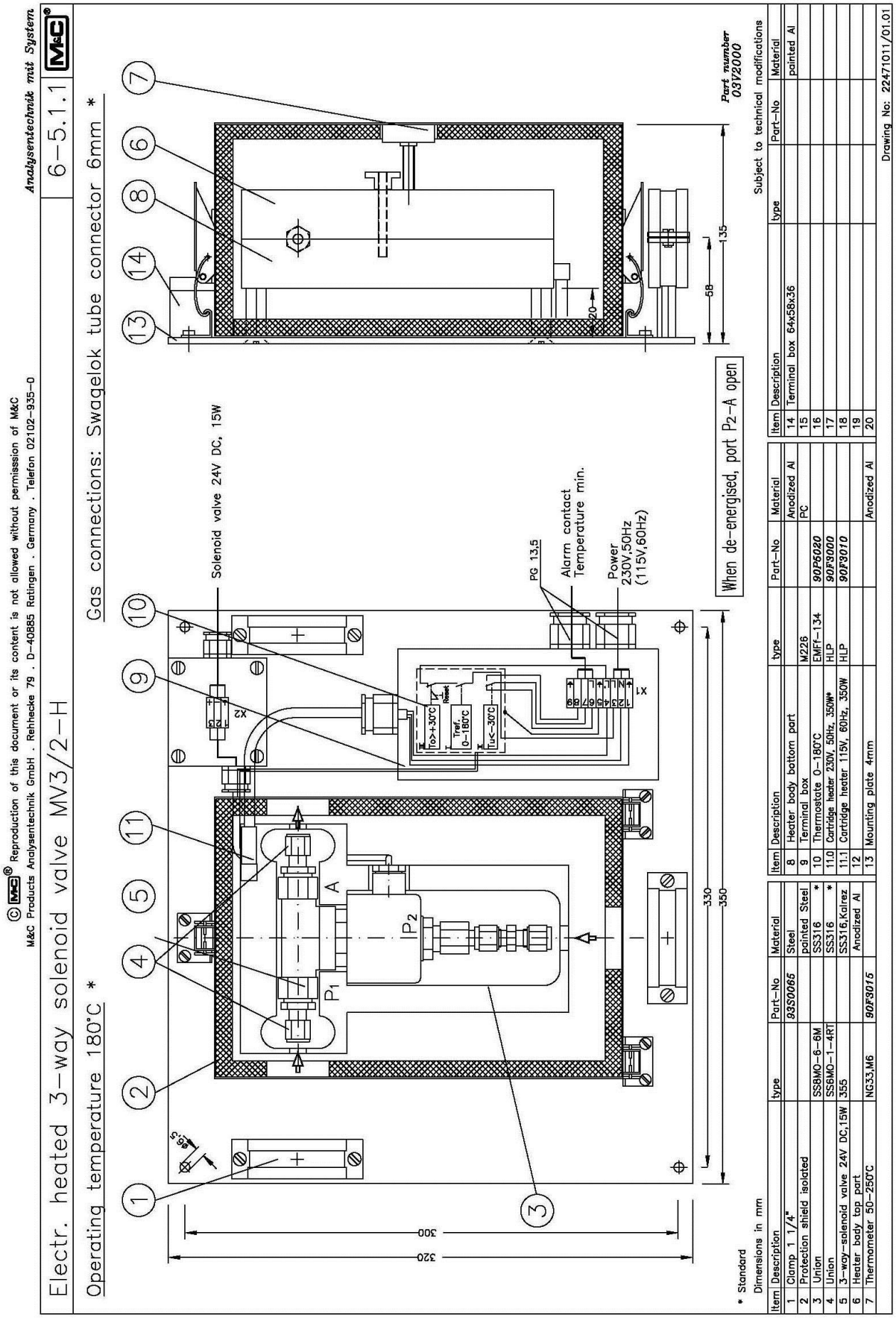
Wear, tear and replacement part requirements depend on specific operating conditions.
The recommended quantities are based on experience and they are not binding.

Heated 3-way-valves type V3/2-H… and MV3/2-H					
(C) Consumable parts **(R) Recommended spare parts** **(S) Spare parts**					
		Recommended quantity being in operation [years]			
Part No.	**Indication**	**C/R/S**	**1**	**2**	**3**
90 F 3000	Cartridge heater HLPSR, 100mm, 230VAC/350W	R	1	1	1
90 F 3010	Cartridge heater HLPSR, 100mm, 115VAC/350W	R	1	1	1
90 F 5020	Thermostat (0-180°C) for FT-…-H2	R	1	1	1

17 APPENDIX

- Electrically heated 3-way solenoid valve MV3/2-H
- Electrically heated 3-way ball valve V3/2-H/PE with 2 off position switch
- Electrically heated 3-way ball valve V3/2-H
- Electrical connections of the electrically heated 3-way ball valve V3/2-H/EA with electrical actuator
- Electrically heated 3-way ball valve V3/2-H/EA with electrical actuator
- Electrically heated 3-way ball valve V3/2-H/EA with electrical actuator and position indication

Further product documentation can be seen and downloaded from our home page:
www.mc-techgroup.com



Item	Description	type	Part-No	Material
1	Clamp 1 1/4"		93S0065	Steel
2	Protection shield isolated			painted Steel
3	Union	SS6MO-6-6M		SS316 *
4	Union	SS6MO-1-4RT		SS316 *
5	3-way-solenoid valve 24V DC,15W	355		SS316,Kalrez
6	Heater body top part			Anodized Al
7	Thermometer 50-250°C	NG33,M6	90F3015	
8	Heater body bottom part			Anodized Al
9	Terminal box	M226		PC
10	Thermostate 0-180°C	EMF1-134	90P5020	
11.0	Cartridge heater 230V, 50Hz, 350W*	HLP	90F3000	
11.1	Cartridge heater 115V, 60Hz, 350W	HLP	90F3010	
12				
13	Mounting plate 4mm			Anodized Al
14	Terminal box 64x58x36			
15				
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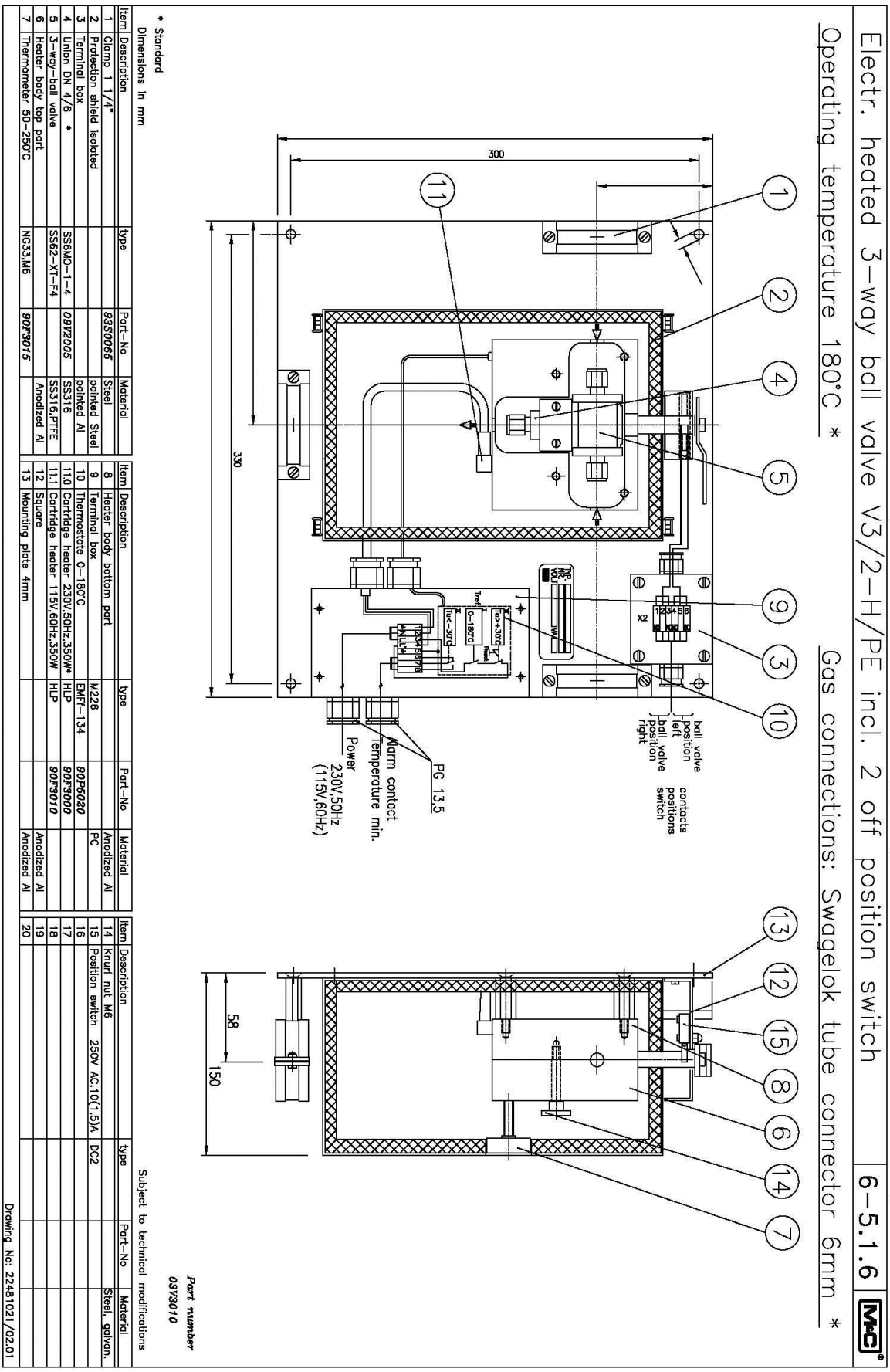
19				
20				

Figure 1 Electrically heated 3-way solenoid valve MV3/2-H

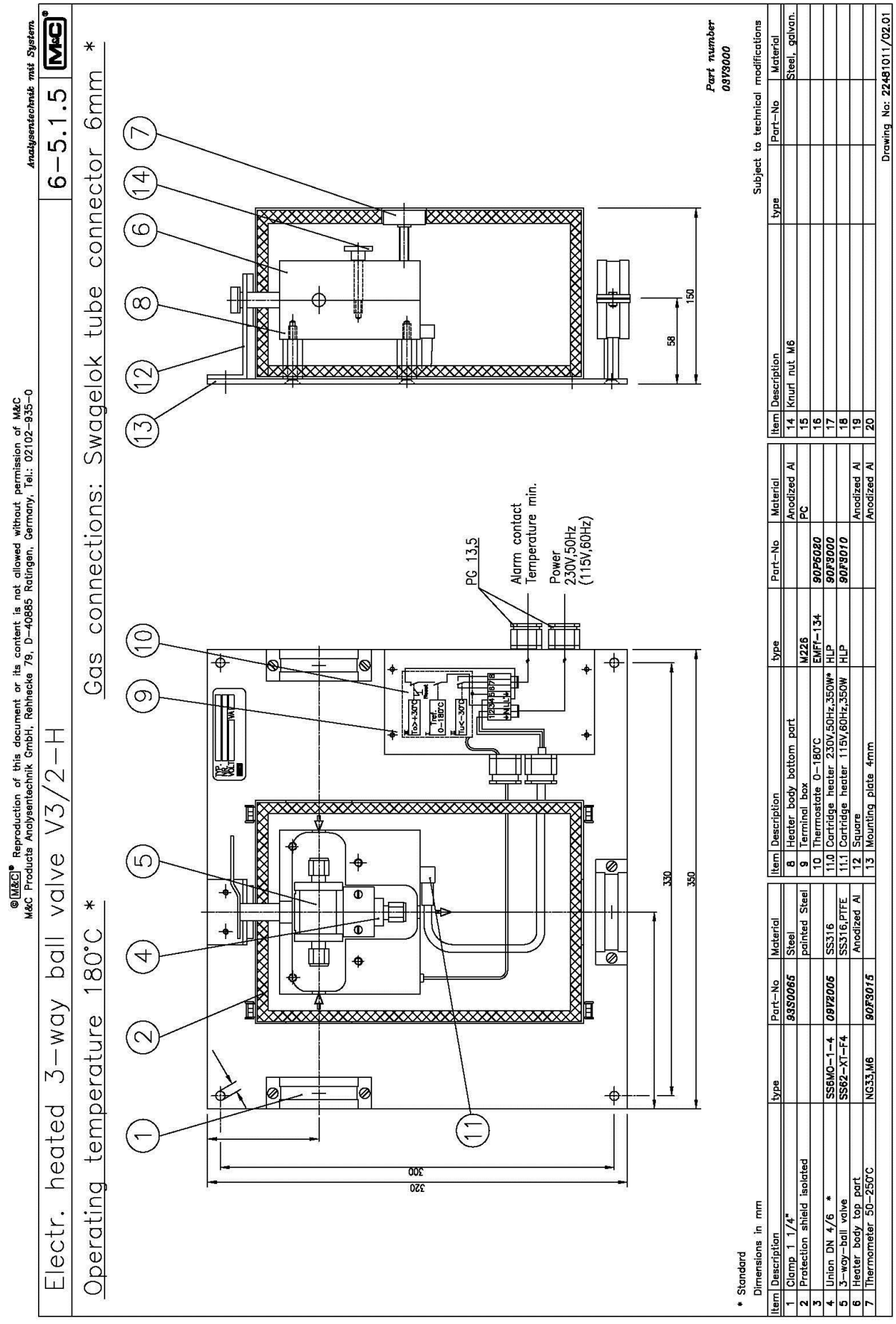


Item	Description	type	Part-No	Material
1	Clamp 1 1/4"		83S0065	Steel
2	Protection shield isolated			painted Steel
3	Terminal box			painted Al
4	Union DN 4/6 *	SS6MO-1-4	09Y2005	SS316
5	3-way-ball valve	SS62-XT-F4		SS316,PTFE
6	Heater body top part	NG33,M6	90F3015	Anodized Al

Item	Description	type	Part-No	Material
8	Heater body bottom part			Anodized Al
9	Terminal box	M226		PC
10	Thermostate 0-180°C	EMFT-134	90P6020	
11.0	Cartridge heater 230V,50Hz,350W*	HLP	90F3000	
11.1	Cartridge heater 115V,60Hz,350W	HLP	90F3010	
12	Square			Anodized Al
13	Mounting plate 4mm			Anodized Al

Item	Description	type	Part-No	Material
14	Knurl nut M6			Steel, galvan.
15	Position switch 250V AC,10(1,5)A	DC2		
16				
17				
18				
19				
20				

Figure 2 Electrically heated 3-way ball valve V3/2-H/PE with 2 off position switch



Item	Description	type	Part-No	Material
1	Clamp 1 1/4"		93S0065	Steel
2	Protection shield isolated			painted Steel
3				
4	Union DN 4/6 *	SS6MO-1-4	03V2006	SS316
5	3-way-ball valve	SS62-XT-F4		SS316,PTFE
6	Heater body top part			Anodized Al
7	Thermometer 50-250°C	NG33,M6	90F3015	

Item	Description	type	Part-No	Material
8	Heater body bottom part			Anodized Al
9	Terminal box	M226		PC
10	Thermostate 0-180°C	EMFT-134	90P6080	
11.0	Cartridge heater 230V,50Hz,350W*	HLP	90F9000	
11.1	Cartridge heater 115V,60Hz,350W	HLP	90F9010	
12	Square			Anodized Al
13	Mounting plate 4mm			Anodized Al

Item	Description	type	Part-No	Material
14	Knurl nut M6			Steel, galvan.
15				
16				
17				
18				
19				
20				

Figure 3 Electrically heated 3-way ball valve V3/2-H

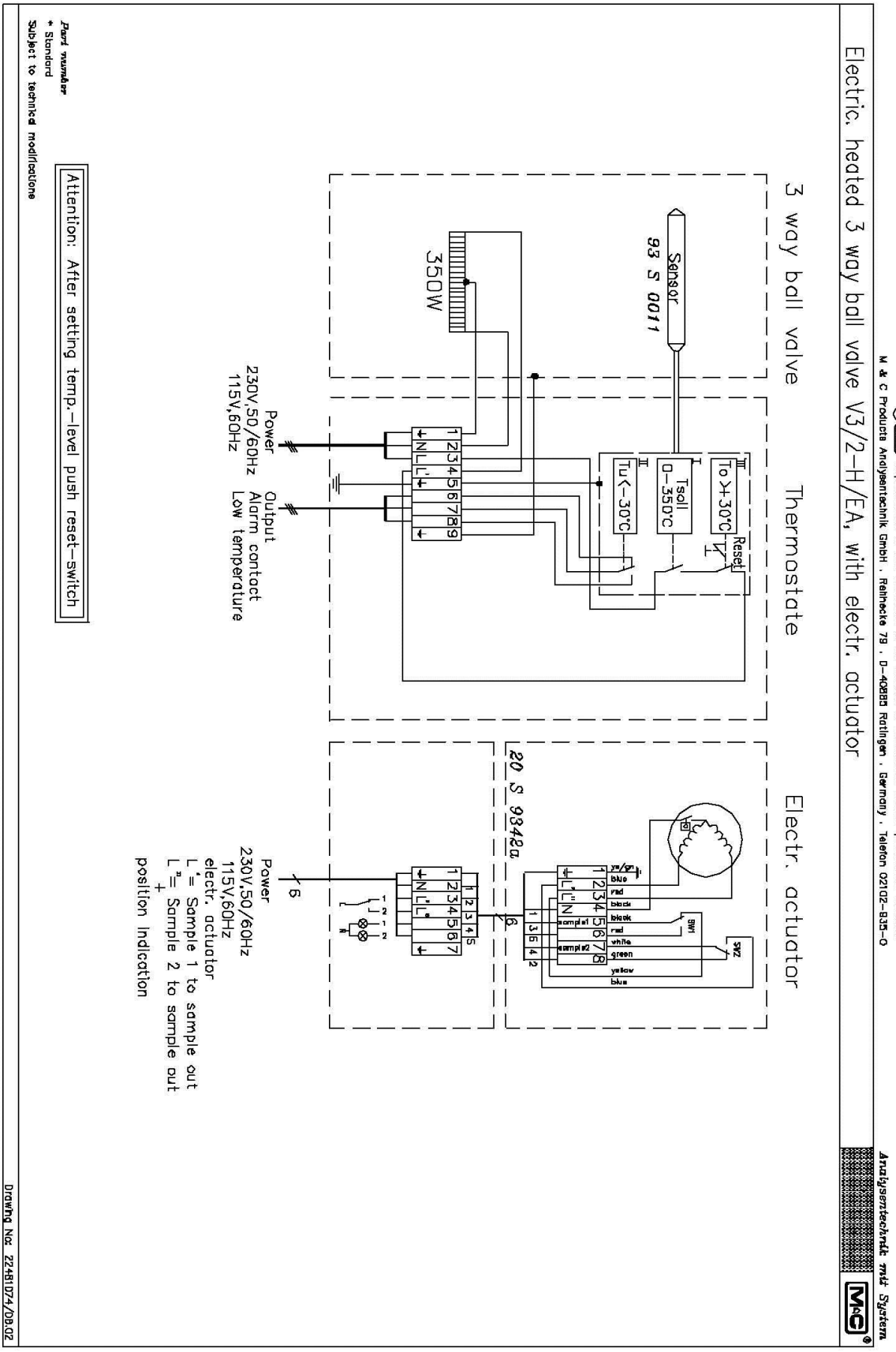
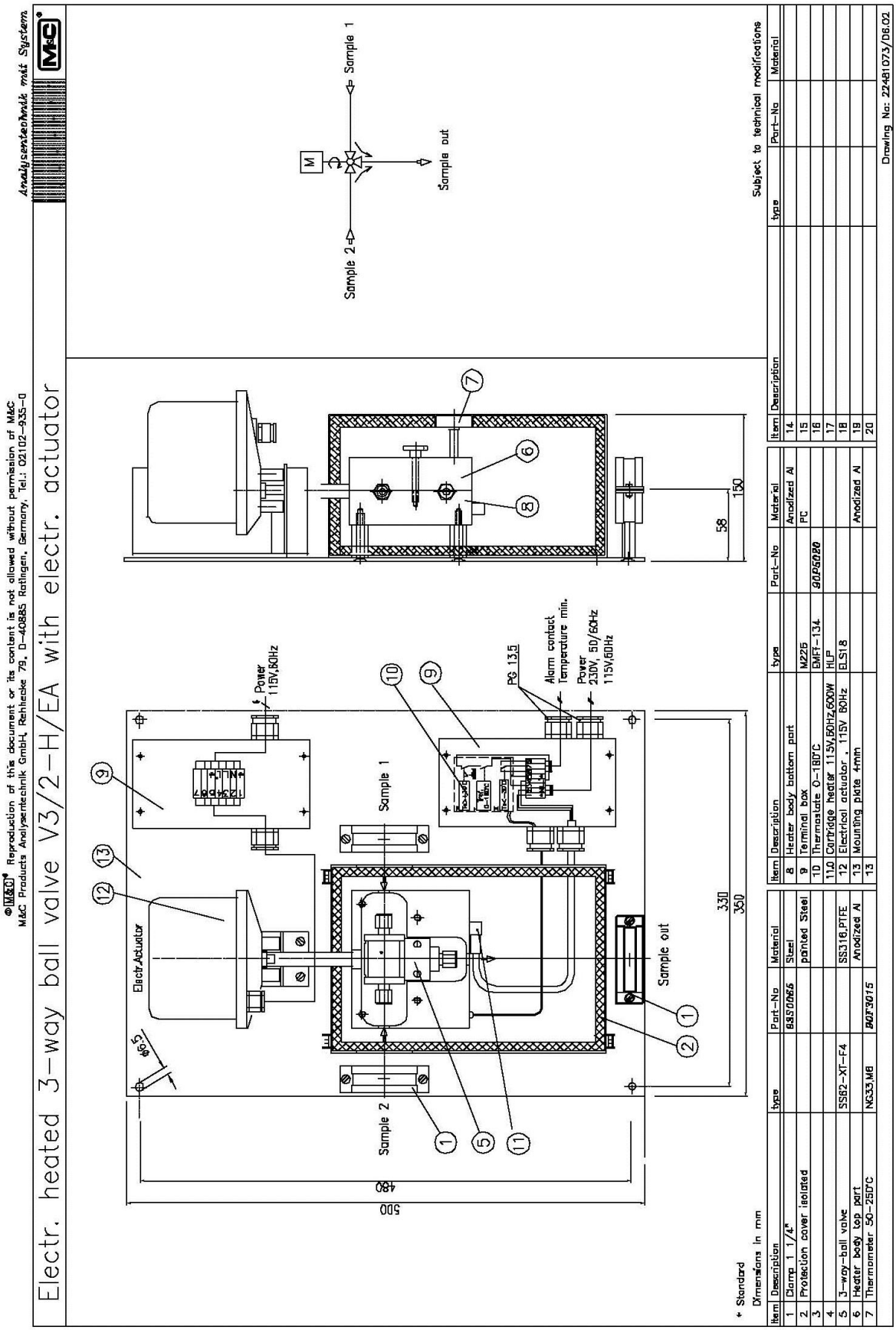


Figure 4 Electrical connections of electrically heated 3-way ball valve V3/2-H/EA with electrical actuator



Item	Description	type	Part-No	Material
1	Clamp 1 1/4"		8A5000B6	Steel
2	Protection cover isolated			painted Steel
3				
4				
5	3-way-ball valve	SS82-XT-F4		SS316,PTFE
6	Heater body top part			Anodized Al
7	Thermometer 50-250°C	N533.M8	8A073015	
8	Heater body bottom part			Anodized Al
9	Terminal box	M225		PC
10	Thermostate 0-180°C	EMFT-134	8AP56080	
11	Cartridge heater 115V,60Hz,600W	HLP		
12	Electrical actuator, 115V 60Hz	EL518		
13	Mounting plate 4mm			Anodized Al
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15				
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20				

Figure 5 Electrically heated 3-way ball valve V3/2-H/EA with electrical actuator

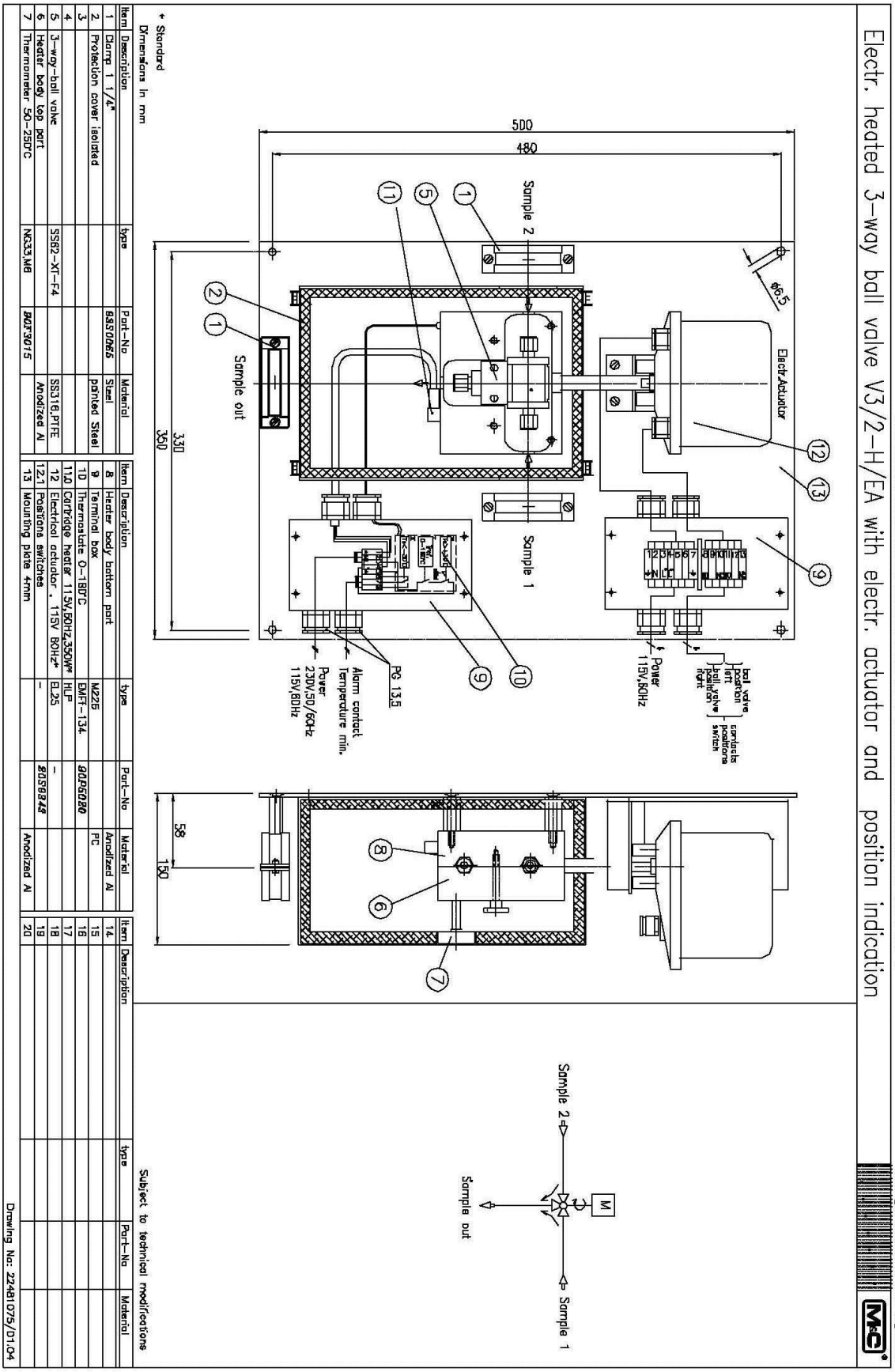

Figure 6 Electrically heated 3-way ball valve V3/2-H/EA with electrical actuator and position indication