731 Relay Box

Manual

8.731.1003

Metrohm

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05.1998 dm

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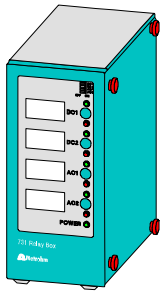
Although all the information given in this documentation has been checked with great care, errors cannot be entirely excluded. Should you notice any mistakes please send us your comments using the address given above.

Documentation in additional languages can be found on *http://documents.metrohm.com*.



1 Overview

1.1 Range of applications

The Metrohm 731 Relay Box is a versatile auxiliary instrument which can be used in may different ways for switching various peripheral devices in complex automated systems. It has been designed specially for factory and laboratory use and makes a wide range of applications possible. Together with a control instrument that is able to set parallel remote lines, the 731 Relay Box allows the individual switching of instruments that have no communication interfaces of their own.

Thanks to the adjustable output level of the low-voltage direct current outputs a wide range of instruments can be powered and switched.

This means that you are able to assemble your laboratory automation system according to your specific requirements.

1.2 Possible applications

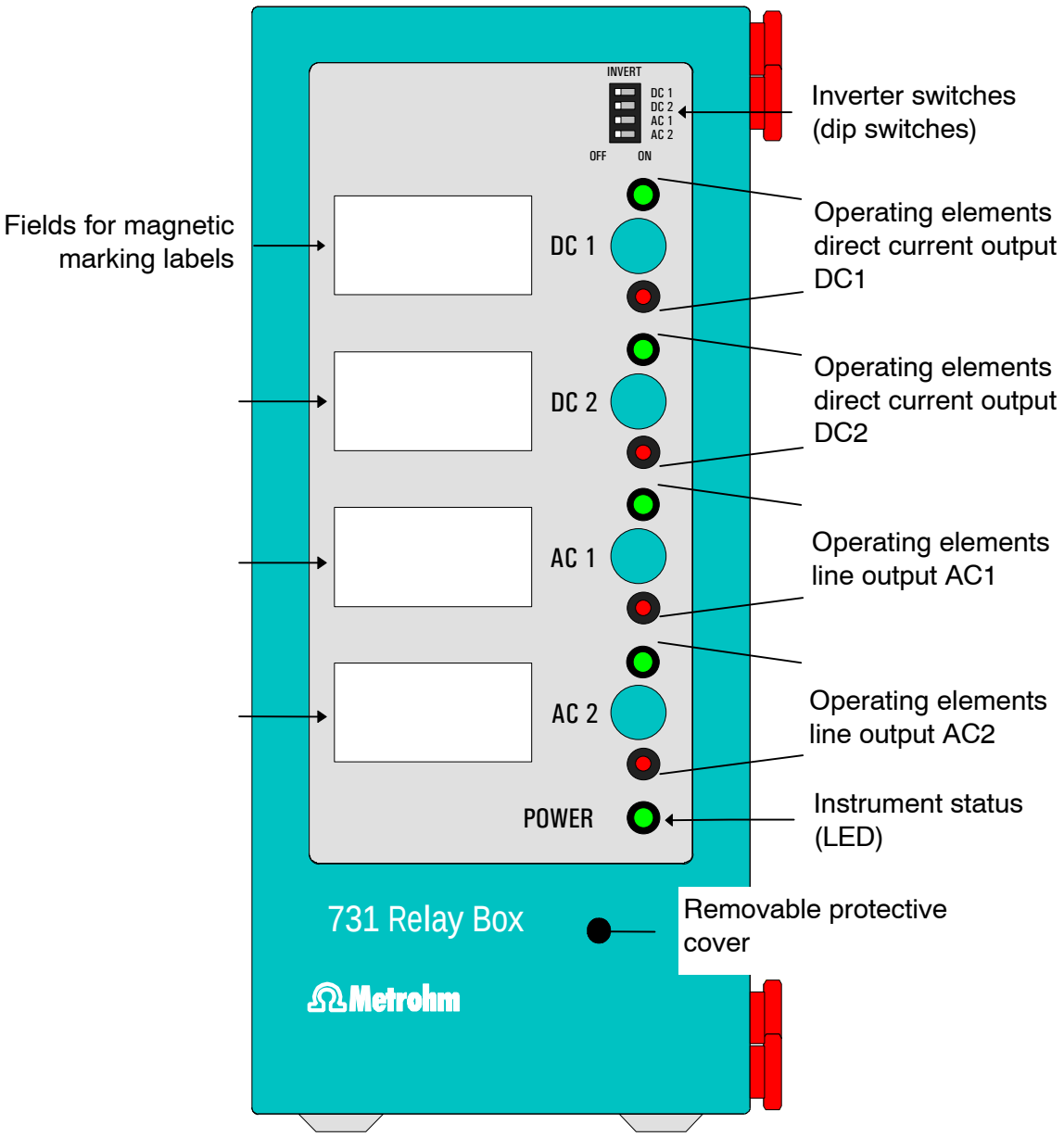
The 731 Relay Box can be controlled by any Metrohm instrument (or by an instrument from other manufacturers) that possesses a remote output whose output lines (TTL level, 5 volt) can be set freely (e. g. 726 Titroprocessor, 730 Sample Changer, 711 Liquino) or which can be set so that they are automatically event-controlled during a method run (e.g. Titrinos, Metrohm pH meters).

Via the 230/110 volt current sockets (AC1 and AC2), instruments such as pumps, heaters, coolers can be supplied with electricity.

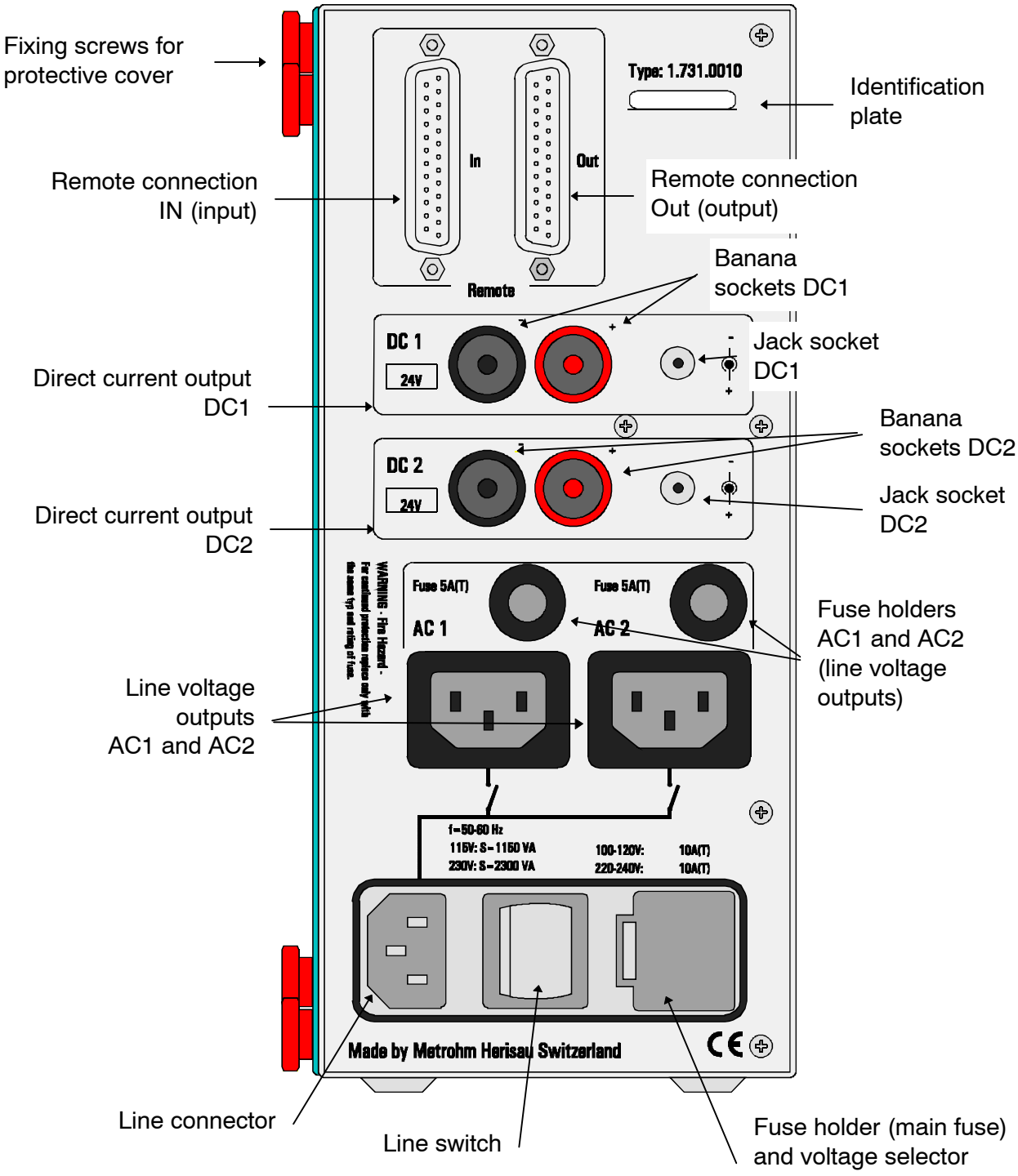
Instruments that require a direct current supply voltage of between 5 and 24 volts or that can be controlled by voltage pulses, e.g. pumps or Dosimats, can be connected to the low voltage direct current outputs (DC1 and DC2).

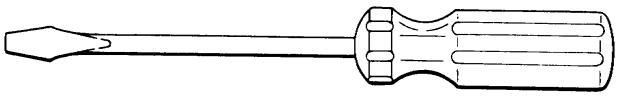
1.3 Instrument description

1.3.1 Front view



1.3.2 Rear view





2 Installation

2.1 Instrument setup

Packaging

The 731 Relay Box is supplied together with the specially packed accessories in packaging containing shock-absorbing foam which provides excellent protection. Please store this packaging as it guarantees damage-free transport of the instrument.

Checks

Please check immediately on receipt whether the shipment is complete and undamaged (compare with delivery note and list of accessories in section 6). If transport damage is established please refer to section 5.1 'Warranty'.

Location

The 731 Relay Box is a robust instrument and can therefore be used even in rough conditions in factories and laboratories.
However, care should be taken that it is not exposed to a corrosive atmosphere. Regular care of the instrument is essential if it is used in rough surroundings.

If an instrument that has been stored at low temperatures is brought into a heated room then the atmospheric humidity may cause water to condense inside the instrument. In order to avoid damage to the instrument, at least one hour should be allowed to elapse before it is switched on.

2.1.1 Line supply

Follow the instructions given below for connection to the line supply. If the instrument is operated with the line voltage incorrectly set and/or the wrong line fuse there is a fire hazard!

Setting the line voltage

Before switching on the 731 Relay Box for the first time check that the line voltage set on the instrument (see diagram on following

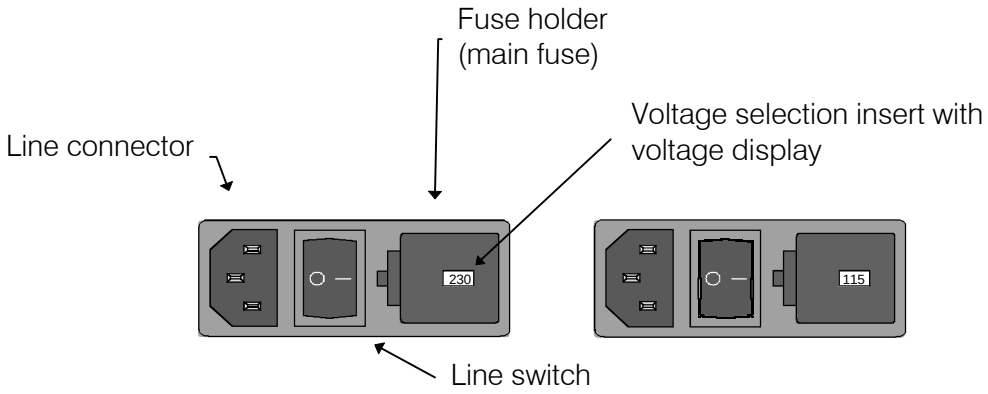
page) corresponds to the local line voltage. If this is **not** the case then the correct line voltage must be set as follows:

Pull out line cable

- Pull the line cable out of the line connector of the 731 Relay Box.

Remove fuse holder

- Use a screwdriver to loosen the fuse holder beside the line connector and pull it out completely.



Checking and replacing the main fuse

- Carefully remove the fuse from the fuse holder and check its specifications:

  220…**250 V 10A (slow-blow)** Metrohm no. U.600.0026

- Exchange the fuse if necessary and reinsert it in the fuse holder.

Make sure that the instrument is never operated with any other type of fuse as otherwise there is a fire hazard!

Change line voltage

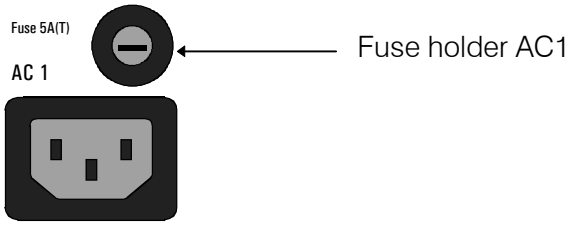
- Carefully remove the voltage selector insert with the help of a screwdriver and rotate it. Replace the insert so that the required voltage is visible in the fuse holder window.

Replace fuse holder

- Insert the fuse holder and click it into position by pressing it down strongly with a finger.

Checking and replacing the AC fuses

Line voltage outputs AC1 and AC2 have their own fuses.



- Use a screwdriver to press down strongly the affected fuse holder and turn it counterclockwise through 90°. Carefully remove the fuse holder.
- Carefully remove the fuse from the fuse holder and check its specifications:

  220…**250 V 5A (slow-blow)** Metrohm no. U.600.0023

  Please note that the specification of this fuse is different from that of the main fuse!

- Replace the fuse if necessary and insert it in the fuse holder again.

2.2 Safety information

General:
This instrument left our factory in perfect condition from a safety consideration point of view (see Technical specifications, Safety specification). To maintain this condition and for danger-free instrument operation the following instructions should be carefully observed.

Line connection:
The line cables supplied with the instrument have three leads and are fitted with a plug having an earthing pin. If a different plug has to be used then the yellow/green lead should be connected to earth.

WARNING!

Any break in the earthing lead, whether inside or outside the instrument, represents a potential hazard to the operator. Making a break in the earthing lead is forbidden.

Before the plug is connected to the line a check must be made to ensure that the instrument is set to the local line supply voltage and that the appropriate fuses are inserted.

WARNING!

When exchanging a fuse and when setting a different line voltage the mains cable must be disconnected from the line supply.

Repair and maintenance:
If errors or malfunctions occur during the operation of the 731 Relay Box then it is recommended that the cable connections with the peripheral devices are checked first for proper functioning (see page 15ff).

If it is absolutely necessary to open the instrument then the following safety measures must be observed at all cost:

The instrument must be separated from all voltage sources before it is opened. Make sure that the line connector has been pulled out.

Condensers inside the instrument may still be charged even when the instrument is no longer connected to the line supply.
Manipulations on an opened instrument that is connected to the line supply should only be carried out by an expert who is familiar with the dangers that this involves.

When replacing fuses care must be taken that the voltage, amperage and type have been correctly selected (see Technical specifications, Fuses, page 23).

WARNING!

Short-circuiting fuses or the temporary use of incorrect fuses is forbidden.

Static electricity:
The circuits contain components that may be destroyed by electrostatic charges or whose functions may be affected by them. Work on open instruments should only be carried out in ESD-protected surroundings.

Suitable measures:

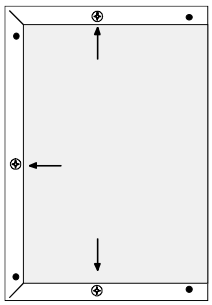
1. Conducting mat on the work surface which is connected to the protective earth via a resistance of approx. 1 megaohm.
2. Earthed soldering bits.
3. The wrists of persons working with components must be earthed by connection to the protective earth via a resistance of approx. 1 megaohm.
4. Components and assembled PCBs should only be stored and transported in conductive packaging or foam.
5. New components should be stored in their original packaging until required.

If it becomes apparent that the instrument can no longer be operated safely then it should not be used at all.

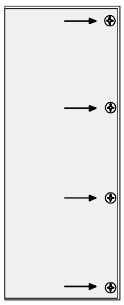
2.3 Setting the DC output voltage

The common output voltage for the direct current outputs (DC1 and DC2) is set inside the Relay Box housing.

- Switch off the instrument and pull out the line plug. Loosen the four knurled screws of the protective cover and remove them.



Right-hand side of housing without protective cover

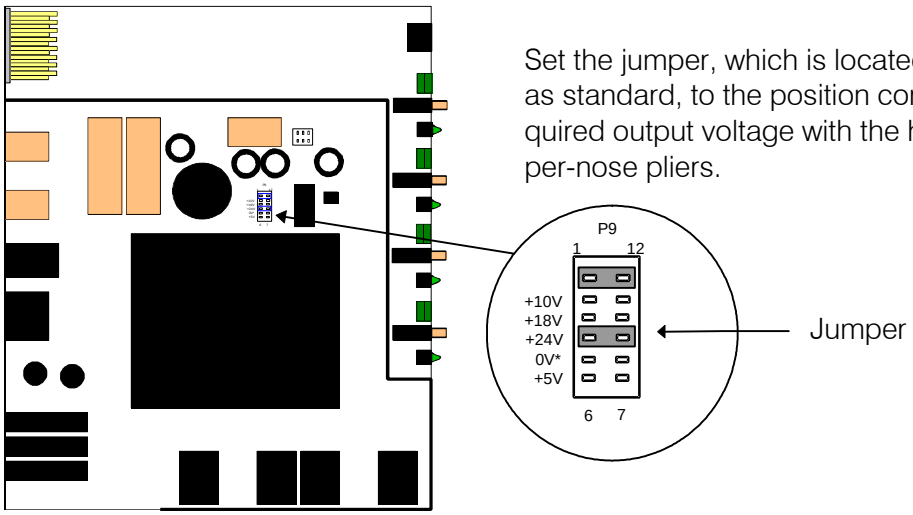


Rear view of housing without protective cover

- The screws marked with an arrow in the diagram must be loosened.
- Carefully remove the instrument PCB from the housing.

To set the output voltage the plug-in bridge **P9** on the relay box motherboard must be fitted with the appropriate jumper .

The location of plug-in bridge **P9** can be seen in the diagram of the instrument motherboard shown below.

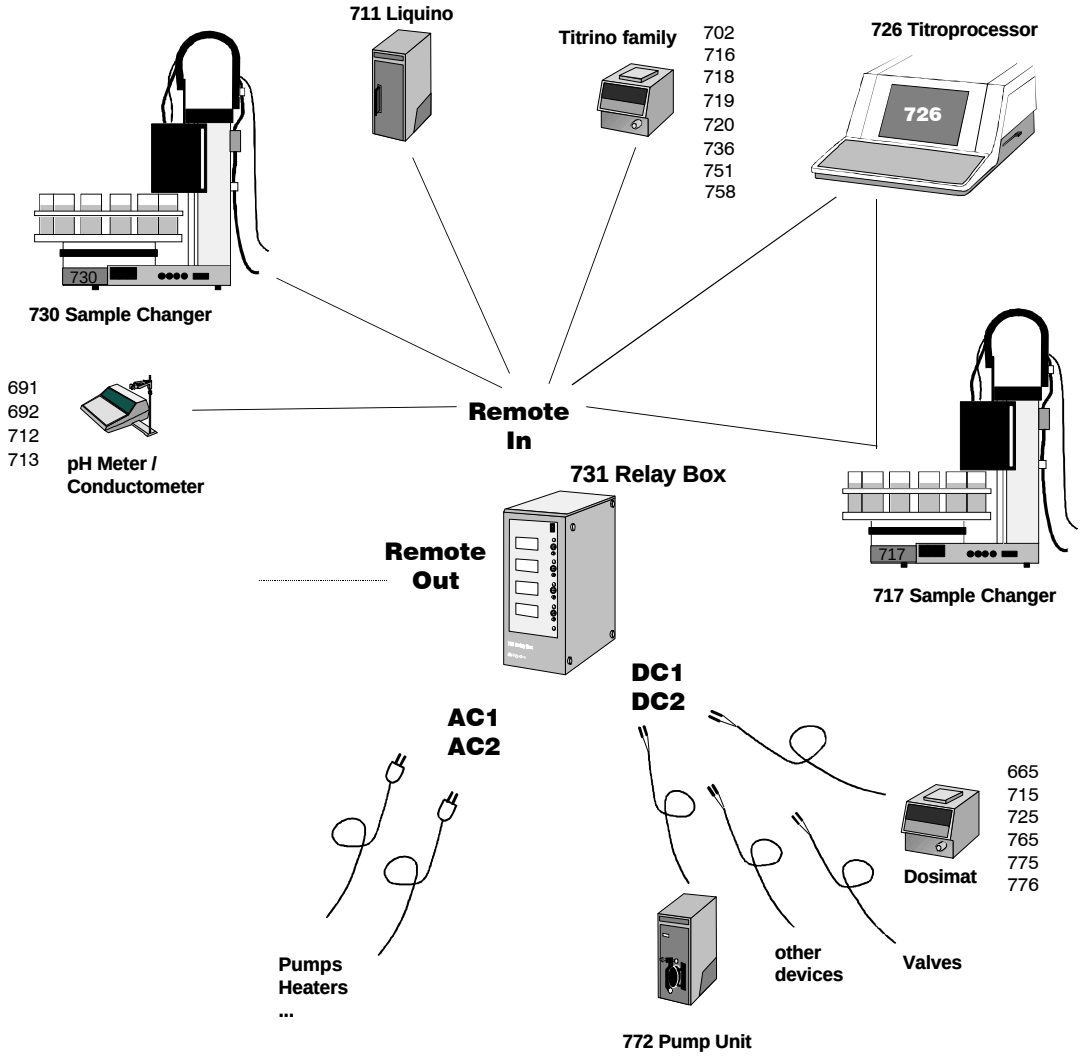


Set the jumper, which is located in the +24 V position as standard, to the position corresponding to the required output voltage with the help of tweezers or taper-nose pliers.

Carefully reinsert the motherboard in the housing and screw the instrument together. Use the adhesive labels provided to note the set output voltage on the rear panel of the instrument.

2.4 Connections

Metrohm automated systems with the 731 Relay Box



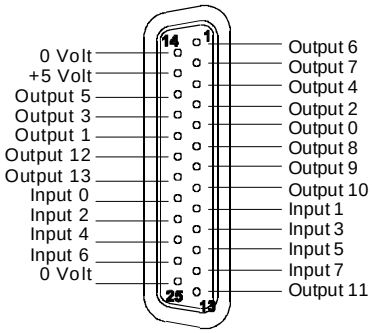
2.4.1 Remote control via remote lines

Remote control of instruments within a Metrohm automated system can (apart from data communication via RS232 connections) be carried out in a simple manner with the help of parallel-switched signal leads, the remote lines (or I/O lines). Signals can be set statically or transmitted as a signal pulse (usually approx. 200 ms long). The signal level is +5 volt (TTL level) in each case.
Most Metrohm instruments are fitted with a remote connection. This is normally a 25-pin socket. Different connection cables are available for different types of instrument. The suitable remote cable is listed in the 'Instructions for use' of the corresponding instrument. Special connection cables can also be made according to information supplied by the customer.

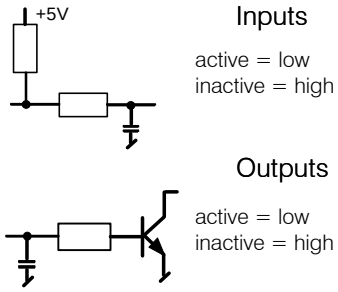
2.4.2 The Metrohm remote socket

Particular instrument functions can be triggered by activating the individual pins (connection pins) of a remote socket. The instrument itself activates certain pins according to the instrument's condition and transmits signal pulses when particular events occur.
The functions which are used for remote control in an automated system are allocated to logical remote lines. They are subdivided into input lines (signal inputs to trigger functions, e. g. START or STOP) and output lines (signal outputs to display the instrument's condition or events, e. g. 'ready' or 'End of Determination' =EOD).

The pin assignation of a 25-pin remote plug can be seen from the information given below.



Remote plug
(with 25 pins)



Electrical switching of the inputs
and outputs of the remote socket

Standard allocation of the remote lines in Metrohm instruments:

Remote lines	Pin	Function
Input 0	21	Start
Input 1	9	Stop
Input 2	22	Enter
Input 3	10	Clear
Input 4	23	Sample Ready
Input 5	11	not used
Input 6	24	not used
Input 7	12	not used
Output 0	5	Ready
Output 1	18	Conditioning ok
Output 2	4	Determination busy
Output 3	17	EOD (End of Determination)
Output 4	3	L1
Output 5	16	Error
Output 6	1	Activate L3
Output 7	2	Pulse for recorder

Output lines 8…13 are normally not used as standard.

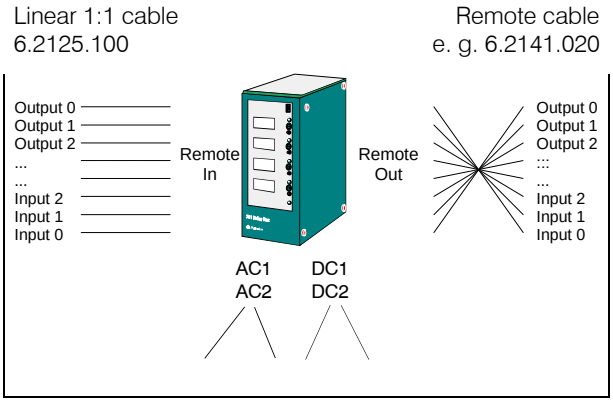
Assignation of the remote socket according to pins:

Pin	I/O lead	Function
1	Output 6	L3 activate
2	Output 7	Pulse for recorder
3	Output 4	L1
4	Output 2	Determination busy
5	Output 0	Ready
6	Output 8	not used
7	Output 9	not used
8	Output 10	not used
9	Input 1	Stop
10	Input 3	Clear
11	Input 5	not used
12	Input 7	not used
13	Output 11	not used
14	0 Volt	
15	+5 Volt	
16	Output 5	Error
17	Output 3	EOD (End of Determination)
18	Output 1	Conditioning ok
19	Output 12	not used
20	Output 13	not used
21	Input 0	Start
22	Input 2	Enter
23	Input 4	Sample Ready
24	Input 6	not used
25	0 Volt	

The pin assignation or the allocation of functions of the remote lines may differ slightly from one Metrohm instrument to another. Consult the 'Instructions for use' of your instrument.

2.4.3 The 731 Relay Box and remote lines

One instrument (Master) sets output lines via remote socket



One instrument receives input signals via remote socket. The remote signals are not influenced by the 731 Relay Box.

The Relax Box 731 scans the output lines and switches the outputs AC1, AC2, DC1, DC2 accordingly.
The signals of the remote lines are transmitted to an additional instrument connected to the 'Remote Out' socket.

2.4.4 Connection cable

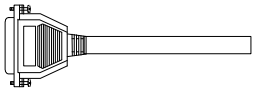
Remote In

Cable 6.2125.100 is required to control the 731 Relay Box. This cable leads the output lines (Output 0…14) linearly (i.e. pin to pin) to the remote input (Remote In) of the 731 Relay Box, which interprets (scans) the remote lines and switches the defined outputs accordingly.

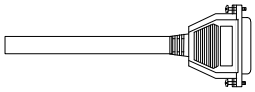
Remote Out

The remote lines pass through the instrument linearly and can be further used at the 'Remote Out' socket. The normal remote cable can be used here for connection to other instruments. In Metrohm remote cables the different remote leads are wired crosswise in order to make the bi-directional remote control of instruments possible. The pins of the logical output lines of plug A are connected to the corresponding pins of the input lines of plug B and vice versa.

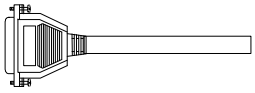
Linear 1:1 6.2125.100 cable (25-pin)



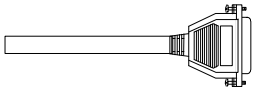
Output 0 (Pin 5)	(Pin 5) Output 0
Output 1 (Pin 18)	(Pin 18) Output 1
…	…
Input 0 (Pin 21)	(Pin 21) Input 0
Input 1 (Pin 9)	(Pin 9) Input 1
…	…
0 V (Pin 14)	0 V (Pin 14)
0 V (Pin 25)	0 V (Pin 25)
+5 Volt (Pin 15)	+5 Volt (Pin 15)



Remote cable e.g. 6.2141.020 (25-pin)



Output 0 (Pin 5)	(Pin 21) Input 0
Output 1 (Pin 18)	(Pin 9) Input 1
Output 2 (Pin 4)	(Pin 22) Input 2
Output 3 (Pin 17)	(Pin 10) Input 3
Output 4 (Pin 3)	(Pin 23) Input 4
Output 5 (Pin 16)	(Pin 11) Input 5
Output 6 (Pin 1)	(Pin 24) Input 6
Output 7 (Pin 2)	(Pin 12) Input 7
Output 8 (Pin 6)	(Pin 6)
Output 9 (Pin 7)	(Pin 7)
Output 10 (Pin 8)	(Pin 8)
Output 11 (Pin 13)	(Pin 13)
Output 12 (Pin 19)	(Pin 19)
Output 13 (Pin 20)	(Pin 20)
Input 0 (Pin 21)	(Pin 5) Output 0
Input 1 (Pin 9)	(Pin 18) Output 1
Input 2 (Pin 22)	(Pin 4) Output 2
Input 3 (Pin 10)	(Pin 17) Output 3
Input 4 (Pin 23)	(Pin 3) Output 4
Input 5 (Pin 11)	(Pin 16) Output 5
Input 6 (Pin 24)	(Pin 1) Output 6
Input 7 (Pin 12)	(Pin 2) Output 7
(Pin 6)	(Pin 6) Output 8
(Pin 7)	(Pin 7) Output 9
(Pin 8)	(Pin 8) Output 10
(Pin 13)	(Pin 13) Output 11
(Pin 19)	(Pin 19) Output 12
(Pin 20)	(Pin 20) Output 13
0 V (Pin 14)	0 V (Pin 14)
0 V (Pin 25)	0 V (Pin 25)
+5 Volt (Pin 15)	+5 Volt (Pin 15)



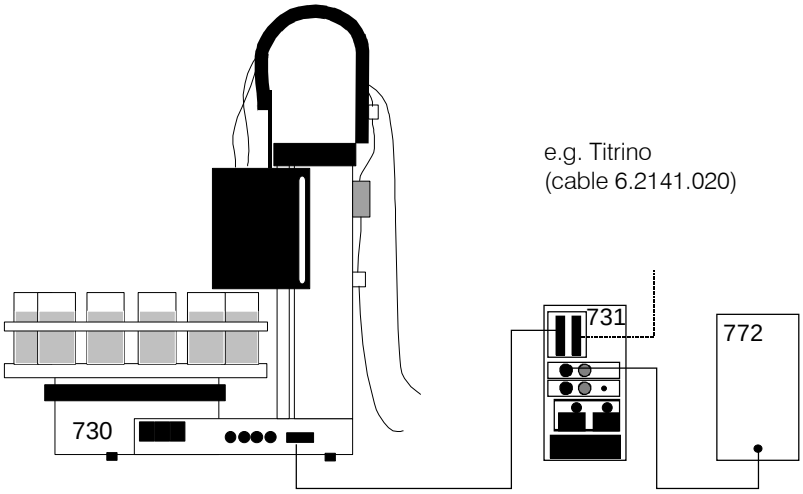
2.4.5 Application examples

The 731 Relay Box is controlled via remote lines which can be freely selected in many Metrohm instruments and set to be operation-controlled.

On the 731 Relay Box an output line must be set for each switchable output; this then controls the corresponding output. This is done with the remote address selection disk on the front of the relay box. Use a screwdriver to set the corresponding number of the output line. See also page 21.

730/717 Sample Changer – 731 Relay Box – 772 Pump Unit

The 772 Pump Unit can be used to aspirate titration samples containing solids.



cable 6.2125.100

Settings for the 731 Relay Box:

Connected to DC1 (or DC2)
Output voltage: 18 or 24 volt
Remote address selection disk DC1: D (=Output 13)

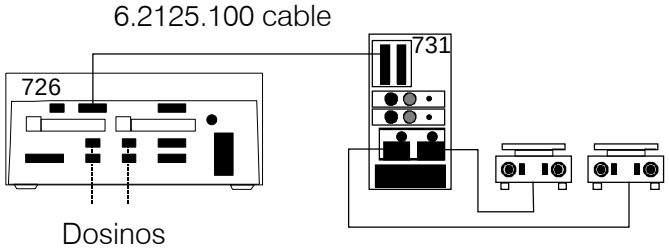
730 Sample Changer, control commands:

`CTL:Rm : 1*************` switches pump on (Output 13)
`CTL:Rm : 0*************` switches pump off (Output 13)

The output lead can be selected freely. Avoid conflicts with other instruments which may be connected, e.g. Titrinos (output lines occupied: Output 0…7).

726 Titroprocessor – 731 Relay Box – 2x hotplates/stirrers

Control of hotplates/stirrers for titrations with the 726 Titroprocessor.



Settings for the 731 Relay Box:

Connected to AC1 and AC2	(line voltage)
Remote address selection disk AC1:	6 (=Output 6)
Remote address selection disk AC2:	7 (=Output 7)

726 Titroprocessor, control commands:

Switching on the hotplates/stirrers:

```
CTRL_RM     Remote   A            Signals         1*******
CTRL_RM     Remote   A            Signals         *1******
```

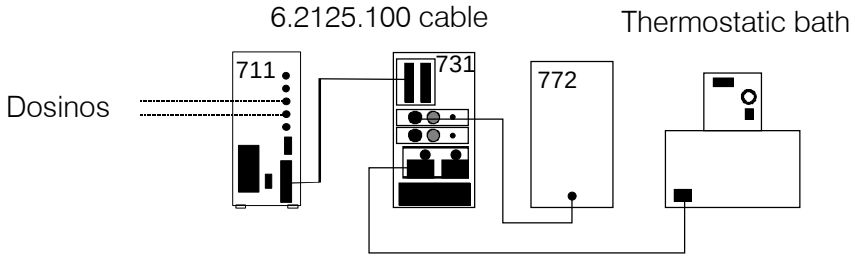
Switching off both hotplates/stirrers:

```
CTRL_RM     Remote   A            Signals         00******
```

The output lead can be selected freely. Avoid conflicts with other instruments which may be connected.

711 Liquino – 731 Relay Box – 772 Pump Unit – Thermostat

Liquid handling setup with 772 Pump Unit as delivery or aspirating pump and a thermostatic bath.



Settings for the 731 Relay Box:

772 Pump Unit connected to DC1 (or DC2)
Output voltage: 18 or 24 volt
Remote address selection disk DC1: 7 (=Output 7)

Thermostatic bath connected to AC1 (or AC2, line supply)
Remote address selection disk AC1: 6 (=Output 6)

711 Liquino, control commands:

SEQ mode
Switch on pump:

```
Command:      CONTROL
Interface:    Remote
Signals       1***----  (Output 7)
(switch off with  0***----)
```

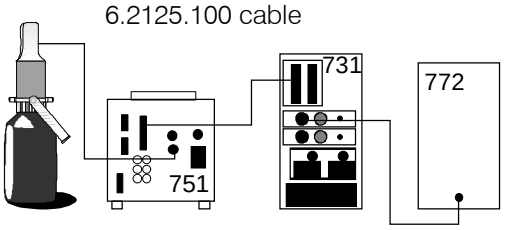
Switch on thermostatic bath:

```
Command:      CONTROL
Interface:    Remote
Signals       *1**----  (Output 6)
(switch off with  *0**----)
```

The output lead can be selected freely. Avoid conflicts with other instruments which may be connected.

751 Titrino with 700 Dosino – 731 Relay Box – 772 Pump Unit

The 772 Pump Unit can be used aspirate the contents of a titration vessel.



Settings for the 731 Relay Box:

772 Pump Unit connected to DC1 (or DC2)
Output voltage: 18 or 24 volt
Remote address selection disk DC1: 4 (=Output 4)

751 Titrino , control commands:

TIP mode

Switch on pump:

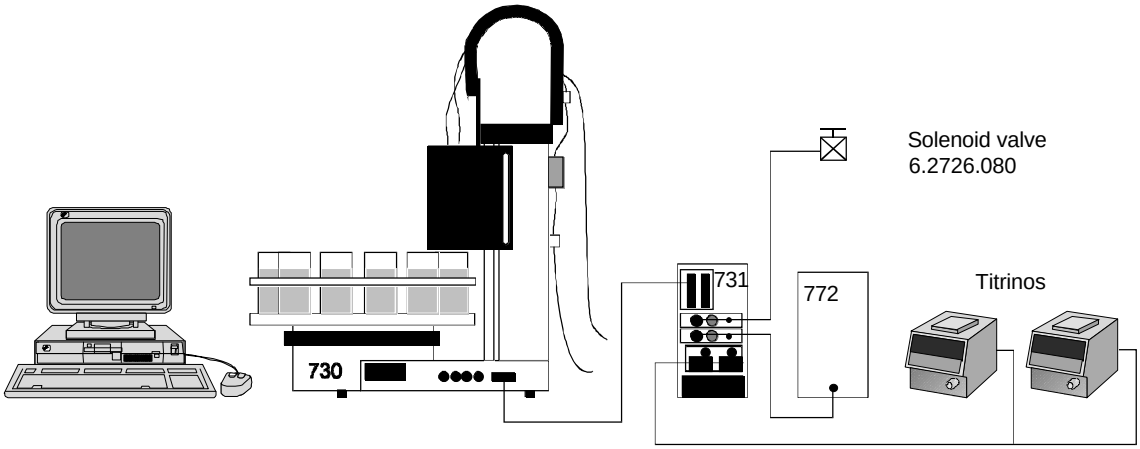
```
>sequence
x.step          output L4
x.output L4:    active
```

Switch off pump:

```
>sequence
y.step        output L4
y.output L4:  inactive
```

PC-controlled titration system with the 731 Relay Box – 772 Pump Unit – aeration valve – 2 x Titrino

For determinations under an inert gas atmosphere an aeration valve can be switched on and off. In larger analytical systems instruments can be switched on and off selectively.



6.2125.100 cable

Settings for the 731 Relay Box:

Aeration valve connected to DC1
Output voltage: 24 volt
Remote address selection disk DC1: D (=Output 13)

772 Pump Unit connected to DC2
Output voltage: 24 volt
Remote address selection disk DC2: C (=Output 12)

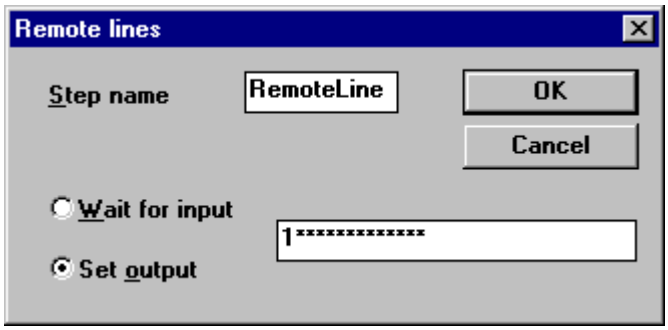
Titrinos connected to AC1 and AC2 (line voltage)
Remote address selection disk AC1: B (=Output 11)
Remote address selection disk AC2: B (=Output 11)

In this way both Titrinos are switched on or off at the same time.

Control commands in Tinet 2.x:

In a sequence for 730 Sample Changer

Switch on aeration valve:



Switch off with bit pattern: `0**********`

Switch 772 Pump Unit:

Bit pattern: *1********** (=on)
Bit pattern: *0********** (=off)

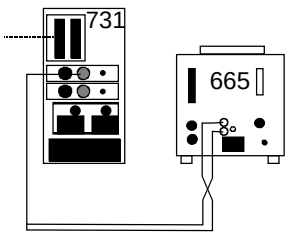
Switch Titrinos:

Bit pattern: **1********** (=on)
Bit pattern: **0********** (=off)

The output line can be selected freely. Avoid conflicts with other instruments which may be connected.

... – 731 Relay Box – 665, ... Dosimat

In an automated system 665, 715, 725, etc. Dosimats can also be used as auxiliary dosing devices . If these cannot be connected directly to the control instrument (via dosing contacts) then this is possible with a 731 Relay Box via remote lines.



2x 6.2106.XXX cable strand, crossed

Settings for the 731 Relay Box:

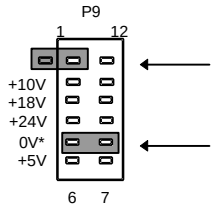
Dosimats connected to AC1 (or AC2)

Important!

The cable strands (with banana plugs) must be connected crosswise to the Dosimats (at the dosing contact), i.e. red plug in black socket and vice versa.

Output voltage:	0 volt
Remote address selection disk AC1:	see previous example

To set 0 volt output voltage the jumper must be set on the mother-board in the following way:



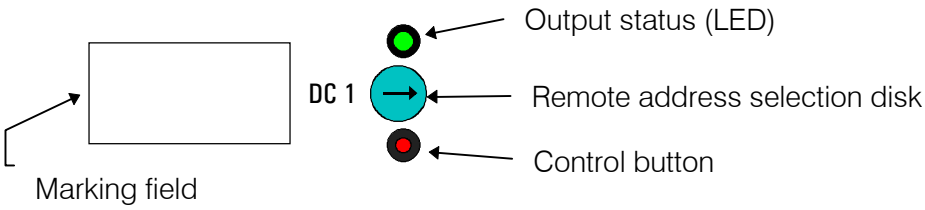
The plug and socket connection between pin 1 and pin 12 must be opened.

Set jumper to 0 V position (pin 5 — 8).

Further information about setting the output voltage can be found on page 8.

3 Settings

3.1 Possible settings



For each switchable output (DC1, DC2, AC1, AC2) the operating and control items represented above are available.

- **Marking field**
  With the 731 Relay Box two magnetic shields are provided. Use scissors to adapt these to the desired length. Use the shields to mark each output, e.g. with the designation of the device that is attached to the corresponding output.

- **Output status (LED)**
  The status indication lights up if the corresponding output is switched on.

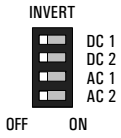
- **Remote address selection disk**
  With the help of a screwdriver the remote line, that is to be monitored can be selected (0=Output 0, …, A=Output 10, B=Output 11, C=Output 12, D=Output 13, E and F do not have any function). If the selected remote line (output 0... 13) is active, the corresponding output (DC1, DC2, AC1, AC2) is switched on. If the output line is inactive the output is switched off .

  If the correct output line of a certain signal is not known, you may proceed as follows: Set the status of the sending so that the desired condition is established.Turn the remote address selector until the status LED lights up. Maintain this adjustment.

- **Control button**
  By pressing the control button, the corresponding output can be switched on for a short time.

3.2 Inverting

For each switchable output a DIP switch is available, with which the circuit logic can be inverted.



If a DIP switch is thus switched 'INVERT ON ' (to the right) by means of a screwdriver, the appropriate output (DC1, DC2, AC1 or AC2) is switched on if the output line is inactive .

The relationship remote 'active' ⇒ output 'off' is then observed, and vice versa.

The inverting circuit can also be useful to, e.g., constantly supply an AC output (AC1, AC2) switched on, i.e. an attached device is continuously supplied with line voltage.
To do this, set the Remote address selector AC2 (or AC1) to a position without function (E or F) and the corresponding INVERT DIP switch to 'ON'.

4 Technical specifications

Dimensions	Width: 102 mm, height: 225 mm, depth: 191 mm
Weight	4.5 kg without accessories
Housing	metal case, multiple stove-enamel
DC-Sockets	Output voltage, adjustable 0, 5, 10, 18, 24 V Max. load: 1 A each output
AC-Sockets	Output voltage = supply voltage Max. load: 5 A each output Breaking capacity: 1150 VA (at 230 V) each output

Remote-Interface

Remote In	D-Sub socket 25-pins 14 x Input 5V TTL or CMOS active = low >100 ms inactive = high
Remote Out	D-Sub socket 25-pins 14 x Output open collector < 40V < 20mA active = low >200 ms inactive = high

Ambient temperature

Nominal operating range	+5 ... +40 °C at 20 .. 80% atmospheric humidity
Storage, transport	-40 ... +70 °C

Power supply

Voltage	Voltage selector 115/230V Settings with other supply voltages: 100 V ... 120 V --> 115 V 220 V ... 240 V --> 230 V
Tolerance	±10%
Frequency	50 … 60 Hz
Power input	115 V max 1150 VA 230 V max 2300 VA
Fuses	10 AT for 115/ 230 V (main fuse) 5 AT for 115/ 230 V (AC fuses)

Safety specifications

Constructed and tested according to :
IEC 1010/EN 61010/UL 3101-1 Safety class I,
EN 60 947-1 degree of protection IP2L1.

The instruction manual contains information and warnings which the user should follow to guarantee the safe operation of the instrument.

Electromagnetic Compatibility (EMC)

Emitted interference	Standards met: EN50081-1 01.92, EN55011 (class B), EN55022 (class B) and NAMUR
Immunity to interference	Standards met: EN50082-1 01.92, IEC801-2 to IEC801-6, EN60555-2 and NAMUR

5 Warranty and certificates

5.1 Warranty

The warranty regarding our products is limited to rectification free of charge in our workshops of defects that can be proved to be due to material, design or manufacturing faults which appear within 12 months from the day of delivery. Transport costs are chargeable to the purchaser.
For day and night operation, the warranty is valid for 6 months.
Glass breakage in the case of electrodes or other glass parts is not covered by the warranty. Checks which are not a result of material or manufacturing faults are also charged during the warranty period.
For parts of outside manufacture insofar as these constitute an appreciable part of our instrument, the warranty stipulations of the manufacturer in question apply.
With regard to the guarantee of accuracy, the technical specifications in the Instructions for Use are authoritative.
Concerning defects in material, construction or design as well as the absence of guaranteed features, the purchaser has no rights or claims except those mentioned above.
If damage of the packaging is evident on receipt of a consignment or if the goods show signs of transport damage after unpacking, the carrier must be informed immediately and a written damage report demanded. Lack of an official damage report releases METROHM from any liability to pay compensation.
If any instruments and parts have to be returned, the original packaging should be used if at all possible. This applies above all to instruments, electrodes, buret cylinders and PTFE pistons. The parts must be packed in a dustproof package (for instruments the use of a plastic bag is imperative) before embedding them in wood shavings or similar material. If open assemblies are enclosed in the scope of delivery that are sensitive to electromagnetic voltages (e.g. data interfaces, etc.) these must be returned in the associated original protective packaging (e.g. conductive protective bag).

Exception: Assemblies with built-in voltage source belong in a non-conductive protective packaging. For damage which arises as a result of non-compliance with these instructions no warranty responsibility whatsoever will be accepted by Metrohm.

5.2 EC Declaration of Conformity

The METROHM AG company, Herisau, Switzerland hereby certifies, that the instrument:

731 Relay Box

meets the requirements of EC Directives 89/336/EWG and 73/23/EWG.

Source of the specifications:

EN 50081-1 01.92	Electromagnetic compatibility, basic specification. Emitted Interference
EN 50082-2:1995	Electromagnetic compatibility, basic specification. Interference Immunity

Description of the instrument:

Relay unit for the power supply of 2 AC connectors and 2 DC low-voltage connectors.

Herisau, April 14, 1998

Dr. J. Frank	Ch. Buchmann
Development Manager	Production and Quality Assurance Manager

5.3 Certificate of Conformity and System Validation

This is to certify the conformity to the standard specifications for electrical appliances and accessories, as well as to the standard specifications for security and to system validation issued by the manufacturing company.

Name of commodity:	731 Relay Box	
Name of manufacturer:	Metrohm Ltd., Herisau, Switzerland	
Principal technical information:	Voltages:	100…120, 210…240 V
	Frequency:	50…60 Hz

This Metrohm instrument has been built and has undergone final type testing according to the standards:

IEC801-2 through IEC801-6, EN55011 (class B), EN55022 (class B), EN50081-1 01.92, EN60555-2, NAMUR
— *Electromagnetic compatibility*

IEC1010, EN61010, UL3101-1 safety class 1, EN 60 947-1 degree of protection IP2L1 — *Security specifications*

The technical specifications are documented in the instruction manual.

Metrohm Ltd. is holder of the SQS-certificate of the quality system ISO 9001 for quality assurance in design/development, production, installation and servicing.

Herisau, Apr. 14, 1998

Dr. J. Frank	Ch. Buchmann
Development Manager	Production and Quality Assurance Manager

6 Accessories

731 Relay Box	**2.731.0010**
includes the following accessories:	
Cable DB25 m/m (1:1), shielded, 2 m	6.2125.100
1 Line cable with cable socket, type CEE(22), V	
Cable plug to customer's specifications	
type SEV 12 (Switzerland...)	6.2122.020
type CEE(7), VII (Germany...)	6.2122.040
type NEMA/ASA (USA...)	6.2122.070
Magnetic labels, 20 x100 mm, 2 x	6.2248.000
Adhesive labels, 2 x	S.211.3000
Instructions for use of 731 Relay Box	8.731.1003

Options

Accessories to separate order at additional charge

Line cable, loose end *(freely customizable line cable for connecting the 731 Relay Box to any instrument's line socket)*	D.005.0003
Cable strand, length 100 cm	6.2106.020
40 cm	6.2106.030
300 cm	6.2106.050
200 cm *(for connecting 665, 715, 725, … Dosimats)*	6.2106.060
Remote cable, 731 —> Titrino/692/712/713	6.2141.020
Remote cable, 731 —> 2 x Titrino/692/712/713	6.2141.030
Remote cable, 731 —> 678/682/686/672	3.980.3640

More connection cables on demand.

7 Index