888/890 Titrando

Enter the Titrando world

Metrohm

888 Titrando – potentiometric titrator
890 Titrando – Karl Fischer titrator

The advantages at a glance

- Touch Control with large color screen
- Titrations software *tiamo*™ for operation via PC
- Intuitive operation
- Intelligent Exchange Units
- Intelligent electrodes «iTrodes» for the 888 Titrando
- Potentiometric titration with the 888 Titrando
- Karl Fischer titration with the 890 Titrando
- Sample Processor control
- Network integration via 900 Touch Control
- Online help
- Complies with FDA regulation 21 CFR Part 11 (with 900 Touch Control or *tiamo*™ full)
- USB interfaces for sample changer, printer, PC keyboard, barcode reader ...

Overview of the 888 Titrando and 890 Titrando

	888 Titrando	890 KF Titrando
Intelligent dosing elements for titration	1 integrated Dosimat for Exchange Unit	1 integrated Dosimat for Exchange Unit
Additional dosing elements (dispensing only)	3 x 805 Dosimat with Exchange Unit 3 x 800 Dosino with Dosing Unit	3 x 805 Dosimat with Exchange Unit 3 x 800 Dosino with Dosing Unit
Intelligent Exchange Unit with integral datachip	Yes	
Increments per cylinder volume (Exchange Unit)	20'000	
Measuring interface for pH, U/mV, T/°C	1	–
Intelligent electrodes «iTrodes»	1	–
Measuring input for polarizable electrodes	1	
Operation, dialog	Touch Control or *tiamo*™	
Stirrers, titration stand	801 Stirrer (magnetic) or 802 Stirrer (rod) with 804 Ti Stand or 803 Ti Stand (KF)	
Connections for stirrers and intelligent dosing elements	4 MSB connections (Metrohm Serial Bus, Daisy Chain)	
Connection for sample changer	1 sample changer via USB	
Connections for balances, printer, PC, PC keyboard, barcode reader and/or Lab Link	Via 2 USB Slave Ports, RS-232/USB-Box (option)	
Temperature sensor	Pt 1000 or NTC	–
Differential amplifier	Option	–
Real-time curve display on Touch Control or PC screen	Yes	
DET Dynamic equivalence-point titration	Yes	–
MET Monotonic equivalence-point titration	Yes	–
SET Titration to preset endpoints with automatic conditioning	Yes	–
KFT Volumetric Karl Fischer titration with automatic conditioning	–	Yes
MEAS Measuring mode for pH, U/mV, T/°C, I_{pol}, U_{pol}	Yes	–
CAL Calibration with automatic buffer recognition	Yes	–
Additional titration curve evaluation for: fixed endpoints, pK values (HNP)	Yes	–
Comprehensive GLP/GMP functions; complies with FDA 21 CFR Part 11	Yes	

Uniquely intelligent – easy to operate

Call up the method – press start

Standard user methods facilitate familiarization with the system and allow the Titrando to be usedimmediately. By using our methods you can profit from our many years of experience in the titration field. As storage media for your methods, sample data and resultsthere are the Titrando itself, a USB memory stick or the PC with its numerous possibilitie

Intelligence creates transparency

Operating the Titrando System is simple and intuitive. In addition, the following tools make lifeeasier for the Titrando user:

- The «Quick Access» function (direct parameters) allows direct access to the parameters requiredfor the given application. This means that it is no longer necessary for you to click your waythrough different operating levels!
- The «Help» fixed key shows a content-related help text in the display. The «Follow me» helpfunction is available when working with a PC. Continuous explanations about the current surroundings are given in a separate window and further possible procedures are indicated.
- The standard user methods can be modified to suit your requirements. Method templates andcalculation formula templates are available for developing your own methods. Methods can bestored under meaningful method names (32 characters) and structured directories can be used; this makes sorting, identification and searching much easier.
- Whereas in the expert dialog all settings are available, the routine dialog can be freely configured, i.e. it can be custom-made to meet the requirements of the particular user.

Brainy dosing elements with certification

Metrohm's Exchange Unit sets new standards with regard to reliability. Each Exchange Unit isequipped with a data chip. The Titrando automatically reads from it all the data that it needs tocarry out the titration properly, i.e. type of reagent, titer, last titer determination, shelf-life data andmuch more. In addition, the Titrando compares the data it has obtained with the selected methodand carries out a plausibility test. If the result is negative then a clear error message appears.

In addition, each Exchange Unit is provided with serial and cylinder numbers and is supplied with a certificate of its own. The Titrando checks the preset intervals for the titer determination of thetitrant. This ensures that work is always carried out with the exact titer.

The iTrodes – electrodes with brains

The electrode used for the titration is really the most important component of any titration system.The iTrodes represent our new intelligent electrode generation and guarantee complete traceabilityof the analytical result to each component participating in the analysis.

Digital identification – no more mix-ups

The built-in memory chip allows the storage of such important sensor data as article and serialnumbers, calibration data, calibration history, working life and calibration validity period. All thesensor data is read in automatically when the iTrode is connected to the 888 Titrando. Mixups or editing errors are therefore eliminated. The electrode is identified automatically. If the type ofelectrode is not the same as that defined in the method then the user is informed. This means that it is not possible to use an incorrect electrode.
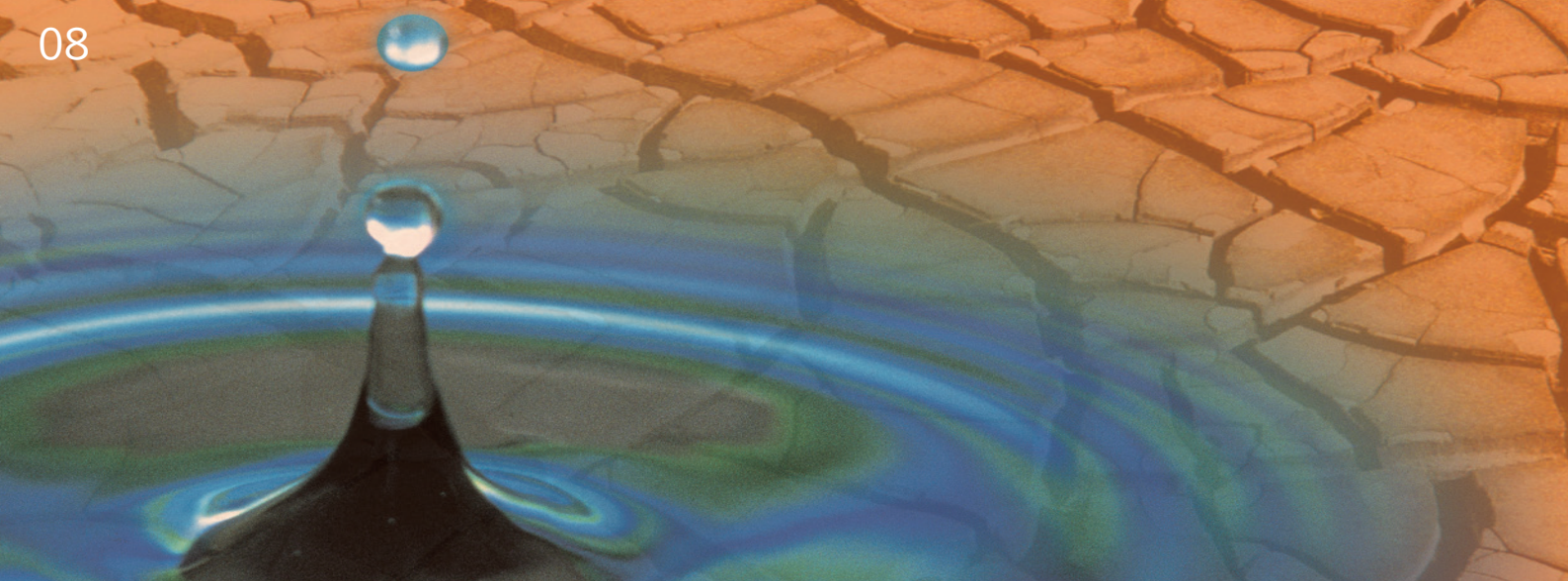
Storage of calibration data – outliers have no chance

Monitoring functions allow the exclusion of electrodes whose calibration data lies outside thelimits or whose calibration period has already expired. If the sensor is used with different instruments or if you wish to prevent inexperienced users from having to calibrate the electrode on theirown instruments then the electrode can be calibrated on a different instrument under definedconditions. The calibration data stored in the chip makes the electrode transferable; it does notneed to be recalibrated each time that it is used with a different instrument.

Compatible with all existing sensors

Despite its new digital measuring interface and intelligent sensors, the 888 Titrando with combined analog and digital measuring input also supports conventional sensors. This means that you can continue to use all your sensors.

Karl Fischer titration with the 890 Titrando

The sophisticated control algorithm and the increased volume resolution of the 890 Titrando's intelligent Exchange Unit guarantee highly precise resultscombined with easy and intuitive user guidance.

The KF icons show you at a glance whether the instrument is still busy conditioning or whether you can start the water determination.
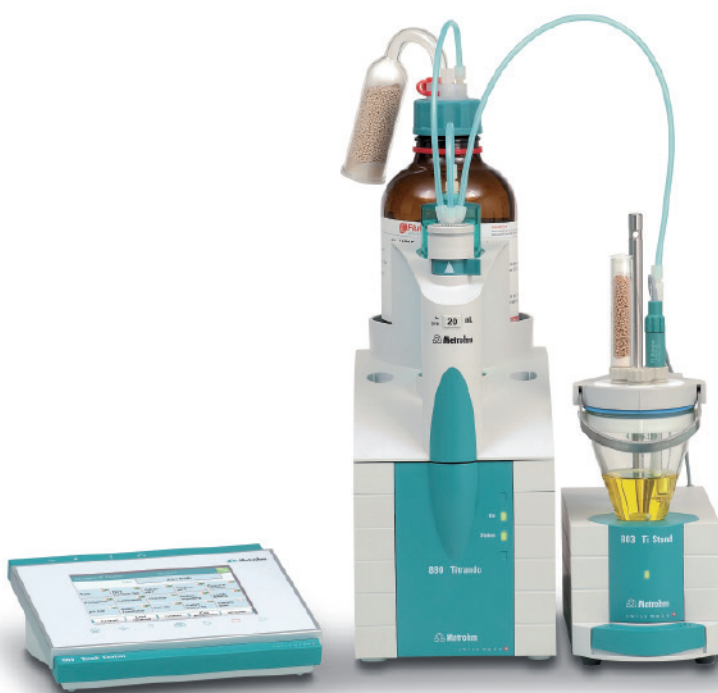
he iodine drop indicates the KF reagent addition during conditioning.

Conditioning is finished and the sample can be added.

The electrode test and the newly created parameter «safety stop» prevent cellrun-over during conditioning. If, for example, the electrode is not connectedcorrectly or the titration cell is very humid, conditioning is stopped after a giventime or a given volume of KF reagent added. This new feature increases work safety in your laboratory.

The 803 Ti Stand for KF titration
Use the 803 Ti Stand for stirring and manually exchanging the spent titration vessel contents. With the integrated membrane pump, solvent can be aspirated or added without the cell havingto be opened. This translates into vastly reduced conditioning times.

The Titrando in the modern laboratory

Touch Control = user comfort

The Touch Control is a decidedly ergonomic and modern operating element. Due to its USB and ethernet interface you can store any data either on a USB memory stick, in your network (as PDF file or for exporting it to your LIMS), or you can print out this data on any printer in your network or connected via USB.

Titrando and PC – a harmonic duo

The Titrations software **tiamo**™ – titration and more – opens up many other possibilities such as database functionality, parallel titration with several instruments and much more.

If you work with **tiamo**™, you can use all the storage options offered by the PC world, and on request the Titrando can produce a machine-readable PC/LIMS report.

Compatibility and traceability

The Titrando System is entirely oriented towards quality management in the laboratory and offers thefollowing possibilities:

- Auto-diagnostic test after switching on.
- Monitoring of validation and service intervals.
- Monitoring of the calibration data of sensors.
- Monitoring of titers and results.
- All changes to the methods are documented.
- Strict control of rights of access using login and password, complying with FDA Regulation 21 CFR Part 11 regarding «electronic signature» and «electronic record».

Integrated automation

Increasing sample numbers, time-consuming sample preparation steps and unattended overnightoperation are good reasons for using sample changers. The 888 and 890 Titrandos have the necessary intelligence to control sample changers. Whether you require small or large sample capacity, one or two working stations, sample metering, sample preparation, liquid handling, rinsing and calibration of the electrodes – the 814 USB Sample Processor and 815 Robotic USB Sample ProcessorXL offer a high degree of automation at low investment costs. It's amazing: You simply connect the sample changer to the Titrando's USB port and the world of automation opens up to you. Our sample changer brochure supplies detailed information on the automation possibilities.

Ordering information, options

2.888.0110	888 Titrando with Touch Control
1 × 2.888.0010	888 Titrando
1 × 2.900.0010	900 Touch Control
1 × 2.801.0040	801 Stirrer (magnetic)
1 × 6.3026.220	Intelligent Exchange Unit (20 mL)
1 × 6.0262.100	Ecotrode plus
1 × 6.2104.020	Electrode cable

2.888.0210	888 Titrando with *tiamo*™ light
1 × 2.888.0010	888 Titrando
1 × 6.6056.231	*tiamo*™ 2.3 light
1 × 6.2151.000	Cable USB A – Mini DIN 8 pins
1 × 2.801.0040	801 Stirrer (magnetic)
1 × 6.3026.220	Intelligent Exchange Unit (20 mL)
1 × 6.0262.100	Ecotrode plus
1 × 6.2104.020	Electrode cable

2.890.0110	890 Titrando with Touch Control
1 × 2.890.0010	890 Titrando
1 × 2.900.0010	900 Touch Control
1 × 2.803.0010	803 Ti Stand
1 × 6.3026.210	Intelligent Exchange Unit (10 mL)

2.890.0210	890 Titrando with *tiamo*™ light
1 × 2.890.0010	890 Titrando
1 × 6.6056.231	*tiamo*™ 2.3 light
1 × 6.2151.000	Cable USB A – Mini DIN 8 pins
1 × 2.803.0010	803 Ti Stand
1 × 6.3026.210	Intelligent Exchange (10 mL)

Optional accessories

2.805.0010	805 Dosimat
6.3026.120	Intelligent Exchange Unit 1 mL for 805 Dosimat
6.3026.150	Intelligent Exchange Unit 5 mL for 805 Dosimat
6.3026.210	Intelligent Exchange Unit 10 mL for 805 Dosimat
6.3026.220	Intelligent Exchange Unit 20 mL for 805 Dosimat
6.3026.250	Intelligent Exchange Unit 50 mL for 805 Dosimat
2.800.0010	800 Dosino
6.3032.120	Intelligent Dosing Unit 2 mL for 800 Dosino
6.3032.150	Intelligent Dosing Unit 5 mL for 800 Dosino
6.3032.210	Intelligent Dosing Unit 10 mL for 800 Dosino
6.3032.220	Intelligent Dosing Unit 20 mL for 800 Dosino
6.3032.250	Intelligent Dosing Unit 50 mL for 800 Dosino
2.804.0040	804 Ti Stand with support
2.802.0040	802 Stirrer (rod) for 804
6.2148.050	USB/RS-232 converter for 900 Touch Control
6.2151.030	Cable USB A – USB B / 0.6 m

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