TITRONIC® *universal*
Titrating manually, dosing perfectly

The TITRONIC® *universal* is a perfect motor-driven burette for manual titration and an extremely precise dosing instrument for dosable liquids, solvents and titrating agents. However, the TITRONIC® *universal* not only first-rate as a stand-alone instrument – it also thrives as the heart of a computer-controlled dosing or titrating system.

Adjusting easily, dosing precisely

With the TITRONIC® *universal* you can preselect any dosing volume from 0.01 ml to 999.99 ml easily with the keypad and you can adjust the dosing speed to a continuously controllable setting. Furthermore, with the TITRONIC® *universal* you can define the waiting time between the volume steps, a useful tool for incremental dosing tasks. The dosing process is carried out precisely upon being called. This, by the way, is also extremely practical in the case of manual titration with the hand-held device: Using a precisely adjusting pre-titrating volume, which can be called up at the press of a button before each titration, you can reduce your titration times considerably.

Documenting results reliably

To document your results, simply connect our small, practical TZ 3460 rollpaper printer or any other printer with a serial RS-232-C interface.

The TITRONIC® *universal* gets on quite well with the PC

We have equipped the TITRONIC® *universal* with **two** serial RS-232-C interfaces. This allows you to not only connect a printer in order to document data in the stand-alone mode but also extends the available range of use of the TITRONIC® *universal* quite considerably. For instance, you can use a PC to control all functions of the TITRONIC® *universal* via one of the two serial interfaces. The address is set automatically or manually. But the TITRONIC® *universal* can do a lot more: For complex dosing and titrating processes, up to 16 burettes can be connected in serieswhenever required. The burettes are connected to one another via the RS-232-C interfaces according to the daisy chain principle. Accordingly, each instrument can then be addressed separately and provides independent feedback data – without an additional data cable.

Technical data

Designed for maximum precision

All components of the TITRONIC® *universal* are designed for maximum precision. This begins with the dosing attachments, which are available in 20 ml or 50 ml volumes. The glass cylinders made of DURAN® borosilicate glass are precisely calibrated and provided with an UV protective coating. The dosing piston is driven by a step motor with a resolution of 8,000 steps. The motor-controlled 3/2-way valve is made of extremely resistant PTFE/ETFE. This 3/2-way valve enables unpressurised drawing and dosing so that outgassing of liquids is prevented as well as vapour formation due to excessive vacuum pressure.

Made for robust laboratory operation

All parts of the TITRONIC® *universal* that come into contact with liquids are made of chemically resistant materials. A polyester front foil protects the keypad and display, and the tubing is in FEP with UV protection.

The magnetic stirrer is available as an accessory

The TM 96 magnetic stirrer is available as an accessory. It is connected directly to the burette, which provides the necessary power.

Keyboard connection	miniature 4 pole round socket, conforming to DIN standards
Stirrer connection	plug-and-socket connection with integrated low-voltage power supply (15 V DC) for the TM 96 magnetic stirrer
RS-232-C-1	for connecting a printer with serial interface or a PC to document consumption in ml or for data backup
RS-232-C-2	connection of additional piston burettes TITRONIC® *universal* ('Daisy Chain')
Configuration of the RS-232-C interface	connection: miniature 4 pole round socket
	preset: 1 stop bit
	adjustable: baud rate: 1200, 2400, 4800 or 9600 baud
	word length: 7 or 8; parity: no, even or odd
Display	8-line LCD display, 69 x 39 mm, 64 x 128 pixel, with background illumination and contrast adjustment
Volume display	00.00 … 999.9 ml
Display resolution	0.01 ml
Dosing volume	0.0 … 999.99 ml
Dosing speed	0.1 … 40 ml/min (with 20 ml dosing unit)
	0.1 … 100 ml/min (with 50 ml dosing unit)
Filling time	30 s to 999 s adjustable (100 % in relation to the cylinder volume)
Pre-titrating volume	0.1 ml to 99.99 ml
Increment volume	0.01 … 999.99 ml
Waiting time between the increments	0.1 … 999.9 s
Cylinder	20 ml or 50 ml DURAN® borosilicate glass cylinder with UV protection sleeve
Dosing accuracy	systematic error 0.1 %, random error 0.05 %, determined according to EN ISO 8655-6
Valve	3/2-port directional control valve made of PTFE / ETFE
Tubing	FEP with UV protection
Housing material	polypropylen and polyflamm RPP371 NT, 20 % talcum
Front foil	polyester
Dimensions	135 x 310 x 205 mm (W x H x D), including dosing unit, without stirrer
Weight	approx. 2.1 kg
Ambient temperature	+10 … +40 °C (for operation and storage)
Power supply	230 V~; 50/60 Hz or 115 V~; 50/60 Hz
Power consumption	18 VA
Conformity	EN ISO 8655-3

With the TITRONIC® *universal* in the stand-alone mode, you can use the keypad to input all settings conveniently on the instrument. The practical hand-held device can be used for manual titrations or to start and stop a dosing task. (The bottle set must be ordered separately as an accessory.)

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Ordering information TITRONIC®, TitroLine

TITRONIC® *basic* and TITRONIC® *universal*	Order no.
TITRONIC® *basic* module 1, (230 V)	285212572
TITRONIC® *basic* module 2, same as module 1, with magnetic stirrer TM 96, (230 V)	285212823
TITRONIC® *universal* 20 ml module 1, (230 V)	285212429
TITRONIC® *universal* 20 ml module 2, same as module 1, with magnetic stirrer TM 96, (230 V)	285212437
TITRONIC® *universal* 50 ml module 1, (230 V)	285212445
TITRONIC® *universal* 50 ml module 2, same as module 1, with magnetic stirrer TM 96, (230 V)	285212494
TITRONIC® *basic* module 1, (115 V)	285212564
TITRONIC® *basic* module 2, same as module 1, with magnetic stirrer TM 96, (115 V)	285212815
TITRONIC® *universal* 20 ml module 1, (115 V)	285211921
TITRONIC® *universal* 20 ml module 2, same as module 1, with magnetic stirrer TM 96, (115 V)	285211962
TITRONIC® *universal* 50 ml module 1, (115 V)	285211979
TITRONIC® *universal* 50 ml module 2, same as module 1, with magnetic stirrer TM 96, (115 V)	285211987

TitroLine *easy*	
TitroLine *easy* module 1 without electrode, (230 V)	285212597
TitroLine *easy* module 2 for pH titration, same as module 1, with one pH-electrode and buffer set, (230 V)	285212848
TitroLine *easy* module 3 for halogenide titration, same as module 1, with one silver combination electrode, (230 V)	285212864
TitroLine *easy* module 2 for pH titration, same as module 1, with one pH-electrode and buffer set, (115 V)	285212831
TitroLine *easy* module 3 for halogenide titration, same as module 1, with one silver combination electrode, (115 V)	285212856

Accessories for TITRONIC® *basic*, TITRONIC® *universal* and TitroLine *easy*	
TZ 2005, bottle top adapter, GL 45	285221055
TZ 2008, bottle top adapter, S 40	285221088
TZ 2004, bottle top adapter GL 45, with 1 L reagent bottle, brown	285221047
TZ 3460, RS-232 printer including data cable, (230 V)	285225608
TZ 2074, TitroLine Chart for TitroLine *easy*	1015738

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