

1.1 Selection table titration –
The most important features of titrators TitroLine®

TITRONIC® and TitroLine®
and piston burettes TITRONIC® at a glance

Application	TITRONIC® 300	TITRONIC® 500	TitroLine® 5000	TitroLine® 7000	TitroLine® 7500 KF	TitroLine® 7500 KF trace	TitroLine® 7750	TitroLine® 7800
Intelligent interchangeable units (5, 10, 20 and 50 ml)	1)	■	1)	■	■	—	■	■
Manual titration	■	■	■	■	—	—	■	■
Dosing	■	■	■	■	■	—	■	■
Solutions preparation (manually or automatically with connected balance)	—	■	—	■	■	—	■	■
Automatic titration (independent with external software)	2)	2)	■	■	■	■	■	■
Applications with TitrSoft	■	■	—	■	■	■	■	■
pH-stat-applications (enzyme kinetics, soil samples, biotechnology)	—	—	—	■	—	—	■	■
Applications with sample changer	—	—	—	■	—	—	■	■
pH/mV titrations „aqueous“ (Alkalinity, hydrochloric acid, citric acid, Kjeldahl...)	—	—	■	■	—	—	■	■
pH/mV titrations „non aqueous““ (TAN/TBN, FFA, titrations with perchloric acid...)	—	—	—	■	—	—	■	■
Redox titrations (iodometry, permanganometry....)	—	—	■	■	—	—	■	■
Redox titrations (COD)	—	—	■	■	—	—	■	■
Halide titrations (chloride, “salt”...)	—	—	■	■	—	—	■	■
Hydrogen sulphide and mercaptans	—	—	—	■	—	—	■	■
Sulfurous acid in wine and beverages	—	—	—	■	■	—	■	■
Bromine number	—	—	—	■	■	■	■	■
Water analysis according to KF Volumetric method (10 ppm – 100%)	—	—	—	—	■	—	■	■
Water analysis according to KF Coulometric method (1 ppm – 5%)	—	—	—	—	—	■	—	—
Measuring two parameters at the same time (e.g. pH and Cond)	—	—	—	—	—	—	—	■
Photometric titration (OptiLine 6)	—	—	—	■	—	—	■	■

1) 20 and 50 ml dosing unit usable (no intelligent interchangeable units)
2) Can be used as titration and dosing burette in automatic titration systems

2. Applications Overview (examples)

Water and Wastewater Analysis



Application	TitroLine® 5000	TitroLine® 7000 / 7750	TitroLine® 7800
Alkalinity (p+m-value)	■	■	■
COD	■	■	■
Permanganate index	■	■	■
FOS/TAC	■	■	■
pH + Cond + acid capacity	■	■	■
Kjeldahl-nitrogen/ammonia (after destillation)	■	■	■
Chloride in drinking and wastewater	■	■	■
Chlorine in drinking water	■	■	■
Calcium and magnesium hardness (2 equivalence points)	■	■	■
Total hardness (Sum Ca/Mg; 1 equivalence point)	■	■	■



Food

Application	TitroLine® 5000	TitroLine® 7000 / 7750	TitroLine® 7800
Total acidity in wine and soft drinks	■	■	■
Total acidity in food (ketchup, salad dressing)	■	■	■
Ash alkalinity	■	■	■
Chloride ("salt") in food and mineral water	■	■	■
Sulfurous acid (SO ₂), free and total	■	■	■
Volatile acids	■	■	■
Titrateable acidity in milk (Soxlet Henkel (SH) index)	■	■	■
Reducing sugars	■	■	■
Ascorbic acid (vitamin C)	■	■	■
Calcium in milk and dairy products	■	■	■
Calcium and magnesium in mineral water	■	■	■
Formol index	■	■	■
Nitrite in pickling salt	■	■	■
Iodine number	■	■	■
Peroxide number	■	■	■
Saponification number	■	■	■
Acidity (FFA) in fats and oils	■	■	■

Industrial Products



Application	TitroLine® 5000	TitroLine® 7000 / 7750	TitroLine® 7800
Titration with perchloric acid (waterfree)	■	■	■
Hydroxyl number	■	■	■
NCO (Isocyanate) number	■	■	■
Epoxy number	■	■	■
Acid number in resins and other industrial products	■	■	■
Total acidity in mineral oils ("TAN")	■	■	■
Total base number ("TBN") in oils	■	■	■
Electroplating (Metals, acids, leach, etc.)	■	■	■

- Excellent application suitability
- Titration is possible for this application with restrictions and must be evaluated
- Not applicable



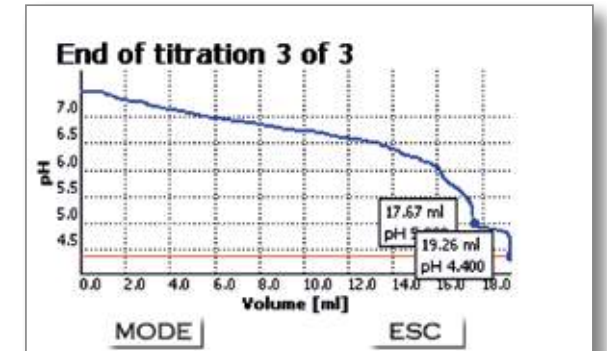
3.2 TitroLine® 5000 - The easiest titration ever...

The predecessor of the TitroLine® 5000, TitroLine® easy, has always been the first choice if you were looking for a very easy-to-use automatic titrator for any application. A special training or a deeper knowledge of automatic titration was not necessary to get precise and quick results. That and much more is exactly what the new TitroLine® 5000 stands for:

- ▶ High resolution pH/mV-measurement input for pH-, ORP-, silver - and further mV-electrodes
- ▶ Pt 1000 and NTC 30 temperature measurement input for automatic temperature compensation
- ▶ Pre-installed standard methods for FOS/TAC, alkalinity, total acidity in drinks, chloride etc.
- ▶ Linear and dynamic titration to equivalence points
- ▶ Titration to pH and mV-end points
- ▶ Same manual titration and dosing function as the piston burette TITRONIC® 300

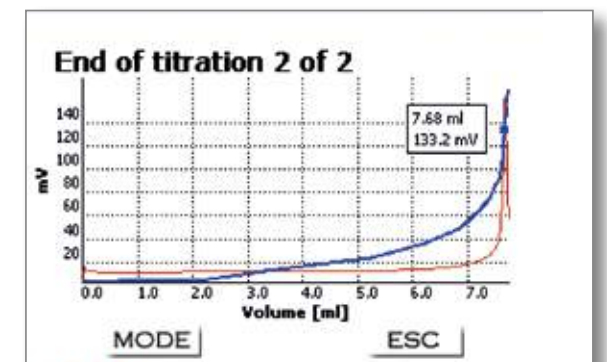
Typical applications of water/wastewater and environmental analysis

- ▶ pH-value, alkalinity (p+m-value)
- ▶ FOS/TAC (see titration curve and result screen as example)
- ▶ Total Kjeldahl nitrogen
- ▶ Permanganat index and COD
- ▶ Chloride in wastewater



Typical applications of food analysis

- ▶ Salt content (chloride, sodium chloride, see titration curve as example)
- ▶ pH-value, total acidity in wine, drinks and other food products
- ▶ Ascorbic acid
- ▶ Protein determination (Kjeldahl-nitrogen in milk and dairy products)
- ▶ Iodine and peroxide value



3.3 Specifications - TITRONIC® 300

Features	
Interfaces:	1 x USB-A and 1 x USB-B, 2 x RS-232-C
Stirrer connection:	TM 50, power supply directly through piston burette
Keyboard:	The unit is operated using the keys on the device itself, the controller TZ 3880 and optional PC-keyboard (USB)
Display:	graphics-capable TFT display.
Volume display:	0000.000...9999.999 ml
Display resolution:	0.005-0.025 ml (depending on dosing unit)
Dosing speed:	max. 100 ml/min (with 50 ml unit)
Filling speed	min 30 s to 999 s adjustable (time according to the cylinder volume)
Dosing units:	20 ml or 50 ml dosing unit, interchangeable
Burette resolution:	8000
Dosing accuracy:	systematic error 0.15 %, random error 0.05 % in compliance with EN ISO 8655-6
Power supply:	100 -240 V~; 50/60 Hz, power input 30 VA
Conformity:	ISO 8655, part 6
CE-mark:	EMC: 2004/108/EG; safety EG- Directive 2006/95
Dimensions	135 x 310 x 205 mm (W x H x D), including dosing unit, without stirrer
Weight:	2 kg (without stirrer)
Ambient conditions	Ambient temperature: + 10 ... + 40 °C for operation and storage. Humidity according to EN 61 010, Part 1:Max. relative humidity 80 % for temperatures up to 31 °C, linear decrease down to 50 % relative humidity at a temperature of 40 °

Ordering information - TITRONIC® 300

Type No.	Order No.	Description
T 300/20 M1	285225800	TITRONIC® 300 without magnetic stirrer TITRONIC 300 basic unit with ready to use assembled 20 ml dosing unit, manual controller, titration clamp, stand rod and power supply 100-240 V
T 300/50 M1	285225810	TITRONIC® 300 without magnetic stirrer TITRONIC 300 basic unit with ready to use assembled 50 ml dosing unit, manual controller TZ 3880, titration clamp, stand rod and power supply 100-240 V
T 300/20 M2	285225820	TITRONIC® 300 with magnetic stirrer TITRONIC 300 basic unit with ready to use assembled 20 ml dosing unit, magnetic stirrer TM 50, manual controller, titration clamp, stand rod and power supply 100-240 V
T 300/50 M2	285225830	TITRONIC® 300 with magnetic stirrer TITRONIC 300 basic unit with ready to use assembled 50 ml dosing unit, magnetic stirrer TM 50, manual controller, titration clamp, stand rod and power supply 100-240 V

Accessories - TITRONIC® 300

Type No.	Order No.	Description
TM 50	285225840	Magnetic stirrer
TZ 3835	285220410	USB-keyboard
TZ 3830	285220420	USB-HUB
TZ 3803	285220590	Reagent bottle, amber, 1l

Specifications - TitroLine® 5000

Features	
Measurement input pH/mV:	pH/mV-input with Electrode socket according to DIN 19 262 or additional with BNC socket insert (Z 860)
Measurement input temperature.:	Pt 1000/NTC 30: (socket 2 x 4 mm)
Interfaces:	1 x USB-A and 1 x USB-B, 2 x RS-232-C
Stirrer connection:	TM 50 power supply directly through piston burette
Keyboard:	The unit is operated using the keys on the device itself, the controller TZ 3880 and optional PC-keyboard (USB)
Display:	graphics-capable TFT display
Volume display:	0000,000...9999,999 ml
Display resolution:	0.005-0.025 ml (depending on dosing unit)
Dosing speed:	max. 100 ml/min (with 50 ml unit)
Filling speed:	min 30 s to 999 s adjustable (time according to the cylinder volume)
Dosing units:	20 ml or 50 ml dosing unit, interchangeable
Burette resolution:	8000
Dosing accuracy:	systematic error 0.15 %, random error 0.05 % in compliance with EN ISO 8655-6
Power supply:	100 -240 V~; 50/60 Hz, power input 30 VA
Conformity:	ISO 8655, part 6
CE-mark:	EMC: 2004/108/EG; safety EG- Directive 2006/95
Dimensions:	135 x 310 x 205 mm (W x H x D), including dosing unit, without stirrer
Weight:	2.3 kg (without stirrer)
Ambient conditions:	Ambient temperature: + 10 ... + 40 °C for operation and storage. Humidity according to EN 61 010, Part 1: Max. relative humidity 80 % for temperatures up to 31 °C, linear decrease down to 50 % relative humidity at a temperature of 40 °

Ordering information - TitroLine® 5000

Type No.	Order No.	Description
TL 5000/20 M1	285225760	TitroLine® 5000 with 20 ml dosing unit Basic unit without electrode, with ready to use assembled 20 ml dosing unit, manual controller, titration clamp, stand rod, magnetic stirrer TM 50 and power supply 100-240 V
TL 5000/50 M1	285225770	TitroLine® 5000 with 50 ml dosing unit Basic unit without electrode, with ready to use assembled 50 ml dosing unit, manual controller, titration clamp, stand rod, magnetic stirrer TM 50 and power supply 100-240 V
TL 5000/20 M2	285225780	TitroLine® 5000 with 20 ml dosing unit Basic unit with pH electrode and buffer set, with ready to use assembled 20 ml dosing unit, manual controller, titration clamp, stand rod, magnetic stirrer TM 50 and power supply 100-240 V
TL 5000/50 M2	285225790	TitroLine® 5000 with 50 ml dosing unit Basic unit with pH-electrode and buffer set, with ready to use assembled 50 ml dosing unit, manual controller, titration clamp, stand rod, magnetic stirrer TM 50 and power supply 100-240 V
TL 5000/20 M3	285225850	TitroLine® 5000 with 20 ml dosing unit Basic unit with Ag-electrode, with ready to use assembled 20 ml dosing unit, manual controller, titration clamp, stand rod, magnetic stirrer TM 50 and power supply 100-240 V

Accessories - TitroLine® 5000

Type No.	Order No.	Description
TZ 3835	285220410	USB-keyboard
TZ 3830	285220420	USB-HUB
TZ 3803	285220590	Reagent bottle, amber, 1l