

Automation



LiquiPhysics™

Automation Solutions

SC1 / SC30

SC1H / SC30H

InMotion™

FillPd™

Efficient, Secure and Powerful
Automation for Density & Refractive Index

METTLER TOLEDO

Automation Of the whole Workflow

Automation from a hardware point of view is more than just a pump which fills the measuring cell of the density meter or refractometer. The benefits of an automated system are more than just saving time and costs. LiquiPhysics™ Excellence allows the entire workflow to be automated for more reliable results, increased safety and no errors.

Pre-measurement



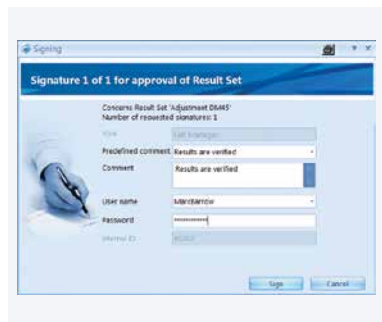
- LabX PC software: importing measurement task directly from LIMS/ERP System to the instrument and scheduling of tasks (e.g. daily calibration at 6 pm.)
- Biometric instrument login with LogStraight™ fingerprint reader
- SmartCodes™: use barcodes for more than just the sample ID. Specify also the Method ID so that the correct method for each sample is automatically selected
- Prepare your samples (e.g. direct degassing of carbonated beverages) or keep them at the correct temperature

Sampling / measuring / cleaning



- Required operator time is reduced to a minimum: just place the vial/ beaker and get the results with a single click or barcode scan
- Increased throughput, particularly when several parameters are combined in one automated system (e.g. density, refractive index, pH and color)
- No more error-prone manual operations such as filling a density meter with a syringe. Even untrained operators always get the correct results!
- Highest possible protection of operators from vapors/toxic samples
- Automatic multiple determination increases result reliability
- Even the most difficult samples can be handled
- Automatic verification if measuring cell is perfectly clean

Post-measurement



- Immediate QC results: product database with stored result limits and automatic result evaluation (pass / fail)
- Any kind of report is possible (strip printer, network printer, PDF, Excel)
- Easy data export to LIMS system
- LabX PC software: full 21 CFR 11 compliance (secure storage of data in SQL database, audit trail and electronic signatures), bidirection integration to ELN, LIMS or SAP

Crude Oil or Beverages? Find the right Automation Solution to suit your Needs



FillPal™ / DryPal™

Working principle: peristaltic pump (FillPal) and drying pump (DryPal) for single samples

Use: sampling directly out of the bottle/container, for low viscosity samples. Either just oversampling or rinsing and drying of the cell after measurements (e.g. oily samples). Can also be used for by-pass at-line measurement. High resistant tube version available (FillPal Chem™)

Typical applications: Beverage analysis (FillPal™ Food) or chemicals e.g. solvents, acids etc. (FillPal™ Chem)



InMotion™ Autosampler

Working principle: Sample changer with peristaltic pump. Sample rack for up to 303 samples

Use: Efficient sampling of low-viscous similar kindred samples that do not require intermediate cleaning of the measuring cell. High resistant peristaltic tube available

Typical applications: Beverage analysis (Brix, pH), including automatic degassing of carbonated drinks. Chemicals such as solvents, antifreeze etc.



SC1 / SC30 Automation Units

Working principle: overpressure filling and fully automatic rinsing and drying of measuring cell(s). For single samples (SC1) or with sample magazine for 30 samples (SC30)

Use: suitable for any kind of sample, be it highly viscous, highly volatile or difficult to clean

Typical applications: Flavor and Fragrance industry (perfumes, essential oils), food (syrups, juice concentrates), Petro industry (light crude oils, refined products, lubricants), cosmetics (creams etc.), chemical industry (solvents, acids, bases, etc.)



SC1H / SC30H heated Automation Units

Working principle: overpressure filling and fully automatic rinsing and drying of single samples (SC1H) or with sample magazine for 30 samples (SC30H)

Use: suitable for density measurement of extremely viscous samples and samples which are solid at room temperature

Typical applications: Petro industry (heavy crude oils, bitumen, waxes, paraffin...) cosmetics (lipsticks), food (honey)

Powerful Automation

For any kind of Sample

Whether for single sample automation (SC1) or as a sample changer (SC30) – the powerful sampling by overpressure allows highly viscous products to be sampled and avoids evaporation of volatile sample compounds. Several instruments (density meter, refractometer, pH / conductivity meter, photospectrometer, titrator, polarimeter etc.) can be combined to a multiparameter measuring system automated with SC1 or SC30. Sampling, contamination free sample recovery if needed, rinsing and drying of all cells and tubes is done fully automatically.



Learn more about the simultaneous measurement of density, refractive index, pH and color. www.mt.com/liquiphysics-multiparameter

Easy & error free



The parameters are determined by simply placing the vial and starting the measurement with OneClick™ on the touch screen display of the density meter or refractometer. A built-in or hand-held barcode reader identifies each sample and automatically starts the corresponding analysis.

Powerful cleaning



The highly effective turbulent cleaning, where the rinsing liquids are mixed with a high proportion of air, ensures fast rinsing cycles and helps to save rinsing solvents. As little as 8 mL of acetone or ethanol can then be sufficient as a second rinsing liquid.

Increased throughput



Save up to 70% labor time and increase throughput by 50% with automated multiparameter systems. All parameters (density, RI, color etc.) are determined simultaneously in all instruments and cleaning is done only once for the whole system with the SC1/SC30.



See a video of the SC1 and SC30 in use:



Heated Power

For highest Viscosities

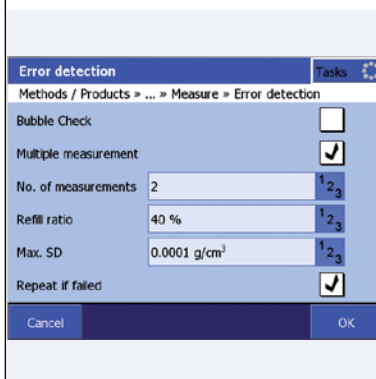
Concerned about measuring density of heavy crude oils, bitumen, lubricating greases or waxes? Or the density of lipstick?

The powerful SC1H (single sample) and SC30H (sample changer) heated automation units can completely automate the density measurement of highly viscous products or even samples that are solid at room temperature. The automated measuring system also protects operators from direct contact with toxic solvents or vapors and from handling hot syringes. High occupational safety at low operational costs.



Learn more about the analytical instruments from METTLER TOLEDO for the petro industry. www.mt.com/analytical-petro

Reliable results



Bubbles are impossible to see in pitch-black petro samples. An automatic two-fold measurement excludes the presence of bubbles and ensures the results obtained are consistently reliable. LiquiPhysics™ density meters convert measured values to required reference temperature and output values (e.g. °API at 15°C).

Health Protection



When measuring petroleum products, hexane and toluene are good for cleaning, but exposure can be harmful. SC automation units protect operators from direct contact with toxic solvents or vapors. The toxic and smelly waste is collected in a separate container, which can be equipped with the LevelSens™ to eliminate the risk of overfilling.

Contact free operation



No mouse to connect, no button to click: Gloves protect your skin as the ErgoSens™ protects your instrument. There is no need to remove protective gloves as the measurement can be started without touching anything. Moving a hand over the ErgoSens™, an infrared sensor for hands-free operation, is all that's needed.



Check the video to see how an SC1H is used for measuring highly viscous bitumen samples



Maximum Productivity In Beverage Analysis

The InMotion™ Autosampler series is the perfect efficient solution for the beverage industry or for other low-viscous samples where oversampling is sufficient, i.e. no intermediate cleaning of the measuring cell is required. Different beaker sizes and up to 303 sample positions offer easy handling and high throughput. Optional stirrer and pH measurement for fruit juices and automatic degassing of carbonated beverages ensure efficient workflows.



Learn more about the analysis of beverages with the InMotion™ autosamplers. www.mt.com/inmotion-beverage

°Brix and pH in beverages



With the overhead Compact Stirrer, juices are properly homogenized and reliable pH results are ensured. It can be used in combination with the DryPal air pump to efficiently degas carbonated beverages prior to analysis of Brix, pH and even acidity in the same system.

Easy to use



With the PowerShower™ it's a matter of a single click on the touchscreen to thoroughly flush the pH electrode, stirrer and sampling tube. Rinsing of the refractometer / density meter and a Test (calibration, check) with water can be done with a single click.

Modular and tailored to your samples



Every lab and sample has its own demands. Build your autosampler according to your sample needs. Use the CoverUp™ lid handling system to protect your samples and operators (e.g. measurement of solvents) as well as a barcode reader for automatic ID and/or analysis method recognition.



Check the video to see an efficient beverage analysis



Technical Specifications



	FillPal		InMotion			SC1 51326000	SC30 51327000	SC1H 51326400	SC30H 51327500	
	Food 51337027	Chem 51337028	Flex 30094291*	Pro 30094292*	Max 30094293*					
max. viscosity [mPa·s]	1'000		1'000			30'000 (at pumping temperature)				
Chemical resistance	organic solvents	Acetone, ethanol	ok			ok				
	acids	no	ok (most)			ok (samples like HBr or HCl only with optional Hastelloy needle)				
	bases	ok	ok			ok				
Sampling	suction (peristaltic pump)					Overpressure (pump is in contact with dry air only)				
Automatic rinsing	no		yes with optional PowerShower™			yes, with 2 rinsing liquids after every measurement (additional rinsing liquids can be incorporated with the TV6 valve)				
Drying	DryPal required		DryPal required			automatic				
Time for filling, measuring	1 to 5 min. (depending on instrument and method settings)					-				
Time for filling, measuring, rinsing, drying	-					3 to 10 min (depending on No. of parameters, sample viscosity, method settings)				
Sample recovery	no		yes			yes, 100% contamination free				
Sample vials	any type		25 mL (glass), 80 (PP), 100 mL (glass or PP)			6, 9 and 20 mL (glass, 20 mL also PP)		20 mL (glass or PP)		
N° of samples / racks	1 (or at-line use with defined interval)		50 x 25 mL (30094124) 27 x 80 mL (30094125) 18 x 100 mL (30094126)	182 x 25 mL (30094129) 69 x 80 mL (30094130) 34 x 100 mL (30094131)	303 x 25 mL (30094134) 113 x 80 mL (30094135) 55 x 100 mL (30094136)	1	30 (6 and 9 mL used with adapter)		1	30
Minimal sample volume	approx. 20 mL					approx. 3 mL (for density and RI and pH at least 6 mL)		6-10 mL		
Temperature	ambient	ambient	optional water bath rack for 100 mL beakers	optional water bath rack for 80 & 100 mL beakers	ambient	ambient	ambient	90 °C (samples with a melting point of up to 60 °C can be handled, e.g. paraffin, edible fats, cosmetics etc.).		
Instruments / Parameters	DM, RM, pH / conductivity		DM, RM, pH / conductivity			DM, RM (plus DX or RX), pH / conductivity, color, others (controlled via RS-232)		DM		
Dimensions W*D*H [mm]	255 x 160 x 85		420 x 534 x 563		420 x 568 x 56	239 x 310 x 342	582 x 392 x 402		400 x 355 x 450	610 x 455 x 500
Weight [kg]	2		12.1	13.7	14.5	9.5	17		19.7	34

*together with the InMotion Flex, Pro or Max base, a rack kit has to be ordered. See order numbers in section 'No. of samples / racks'

Options and Accessories

InMotion™	DryPal™ Drying Pump (51337029) High resistant ChemSure tube for SPR200 sampling pump (30094297) Overhead compact stirrer (51109150) Barcode Reader (30094235) CoverUp™ Flex for 80mL and 100mL (30094252), 10 pcs lids 80mL (30094274), 100mL (30094275) CoverUp™ Pro incl. lids for 80mL (30094253), 100mL (30094254) PowerShower™ pump SD660 (30094165) Rinse tube PowerShower Flex (30094167), Pro/Max (30094226)
SC1 / SC30	ScanStraight™ built-in barcode reader - not for H versions (51337185) PPU Power Purge Unit, for faster cleaning and drying - in H version included (51327365) External drain valve, for samples with solid particles (51327346) Sampling needle made of Hastelloy C22 (51327420)
Common Options	LevelSens™, sensor to prevent waste container overfilling (51109853) ErgoSens™, optical infrared sensor for hands-free operation (11132601)

Learn more about our LiquiPhysics™ density meters and refractometers, find application notes, videos and educational material at:



www.density.com



www.refractometry.com

www.mt.com

For more information

Mettler-Toledo AG, Analytical

CH-8603 Schwerzenbach, Switzerland

Tel. +41 44 806 77 11

Fax +41 44 806 73 50

Subject to technical changes

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