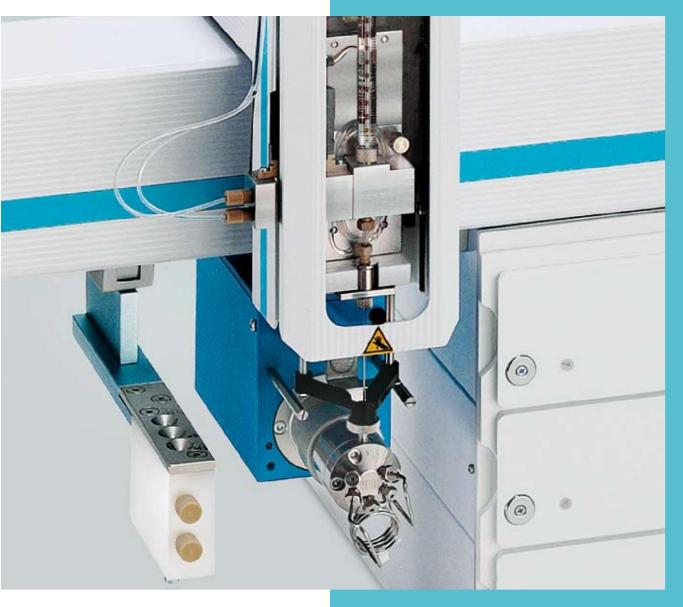


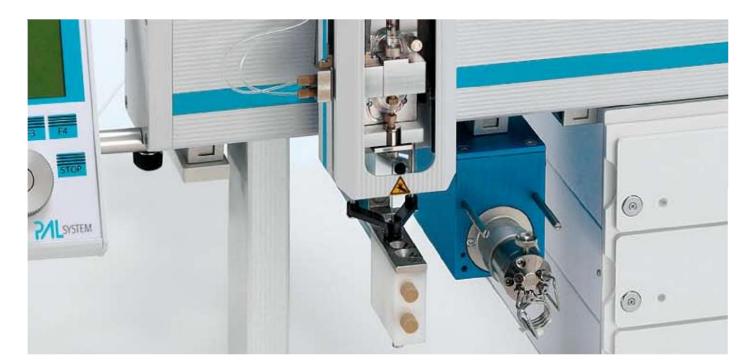
Prep and Load Platform

DLW – Fast and Clean LC/MS Loading



High Throughput Screening Environmental, Food Safety, Forensics Preclinical Research, Metabolomics Drug Metabolism, Pharmacokinetics Protein Biomaker Discovery





DLW wash station



including Syringe set, Pump and Wash Station

Specifications DLW Option

Wetted parts material:	Stainless steel, PEEK
Syringe Size:	100µl
Reproducibility (partial loop):	better than 1 % RSD (under specific conditions)
Carry over:	Typically less than 0.003% (30ppm)
Typical Clean Cycle Time:	less than 1 Minute (Fast Cycle)

Near Zero Carryover – Fast Cycles and exceptional reproducibility

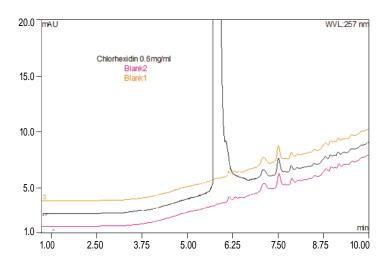
Today's Mass Spectrometers are so sensitive that carryover becomes an issue again. To meet today's requirements for fast, clean and reproducible LC/MS injection; CTC developed the DLW Option for the PAL system (Dynamic Load and Wash).

Now the sample is no longer in contact with the syringe but it is aspirated into a holding loop. The syringe only acts as an aspirator and dispenser device in order to exactly measure the amount of sample which needs to be injected. This yields to excellent reproducibility. After injection, the whole sample path including the valve and the needle is washed from the rear with up to 2 different solvents. Active micro pumps deliver the required quantity of solvent fast and reliable. An active solenoid valve precisely stops solvent delivery or switches between solvents. At the end of the injection cycle all parts which have been in contact with the sample are completely clean. As a result, near-zero carryover is achieved for most components.



Carryover Results UV and MS

These tests show the excellent performance of the DLW in both UV and MS mode.

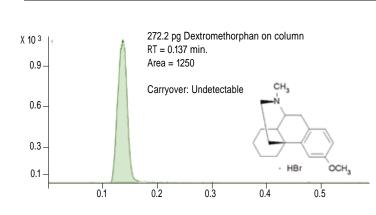


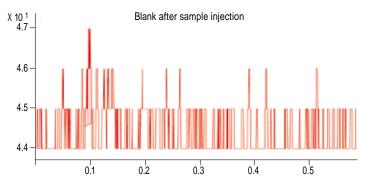
	r UV carryover test
Column:	Halo C18 2.1x50mm, 2.8 µm
Flow:	0.5ml/min
Injection:	Full Loop 2µI (PEEK)
Eluent:	A: H2O + 0.1% TFA / B: Acetonitrile + 0.1% TFA
Gradient:	10%B (0.5 min) – 10% to 90% B (7.5 min) – 90% B (1 min)
Wash1:	H2O + 0.1% TFA
Wash2:	Acetonitrile + 0.1% TFA
Detection:	UV, 257nm

Carryover Test UV: Less than 30ppm carryover (Chlorhexidine)

Injection of 1200 ng Chlorhexidine on column; followed by 2 blank injections using the new DLW option. Less than 0.003% (30ppm) of carryover could be detected.

Carryover Test MS: No Carryover detected (Dextromethorphan)



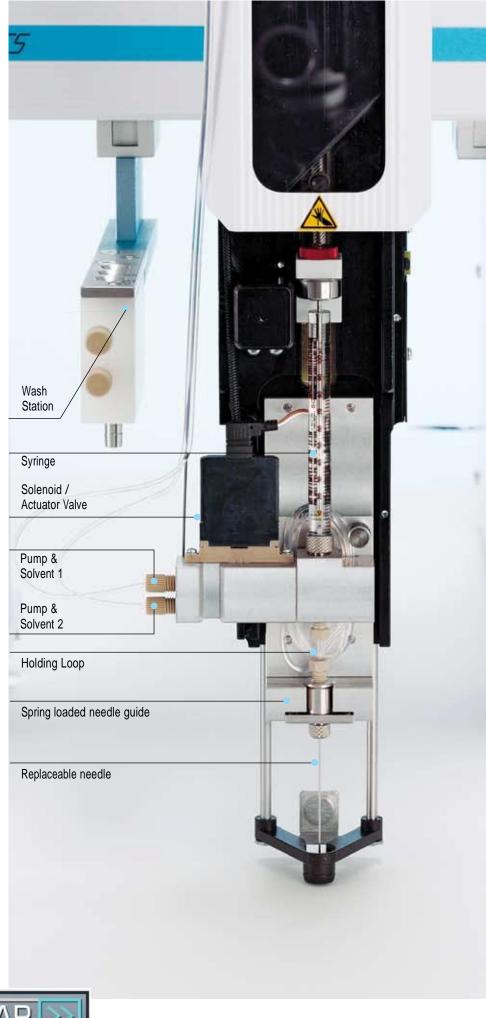


Injection of 272 .2 pg Dextromethorphan on column; followed by blank injection No carryover could be detected.

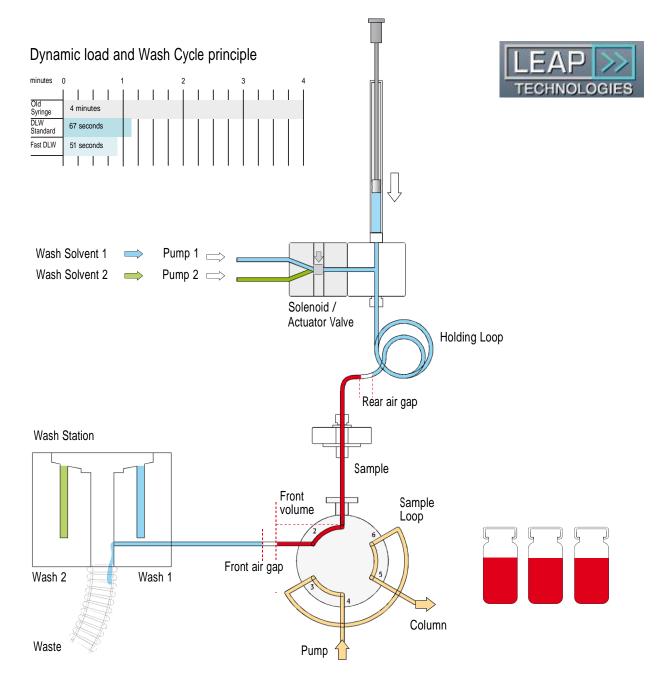
MS Data provided by Agilent Technologies.

Conditions for MS	carryover test
Flow:	0.8 ml/min
Injection:	Full Loop 2µI
Eluent	Isocratic: 40% A (H2O+0.1% TFA) & 60% B (Acetonitrile+0.1% TFA)
Wash1:	H2O + 0.1% TFA
Wash2:	Acetonitrile + 0.1% TFA
Detection: LC-MS/MS)	MS (Agilent 6460 QQQ
	+MRM: m/z 272.2 à m/z 215.2)
Dwell Time:	20ms
Interchannel delay:	3.5 ms
Cycle time =	50 ms









DLW Standard Cycle

cycle start

- 1. aspirate rear air segment
- 2. get sample aspirate rear, inject and front volume.
- 3. aspirate front air segment
- 4. passive needle clean outside in wash position 1
- 5. dispense front air segment and front sample volume to waste
- 6. valve to load position and load inject volume
- 7. valve to inject position and start chromatography
- 8. dispense rear sample and air segment to waste
- 9. valve clean with wash liquid 2
- 10. active needle wash with wash liquid 2
- 11. valve clean with wash liquid 1
- 12. active needle wash with wash liquid 1

cycle end

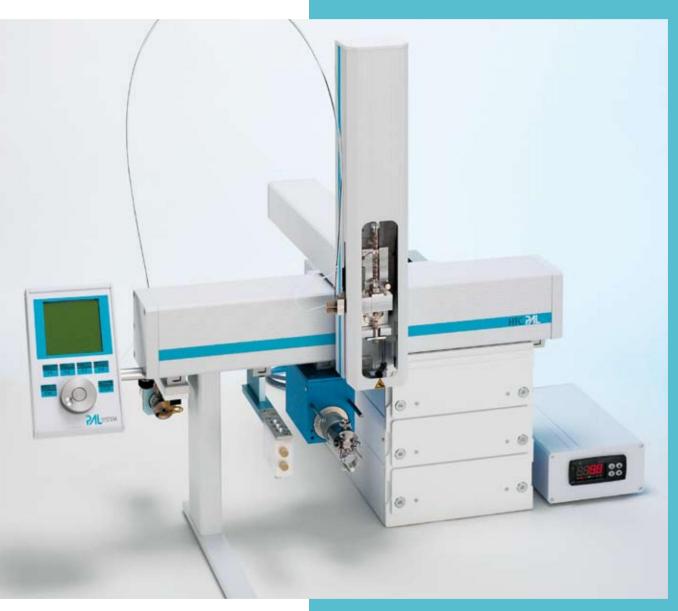
DLW Fast Cycle

cycle start

- 1. aspirate rear air segment
- 2. get sample aspirate rear, inject and front volume.
- 3. aspirate front air segment
- 4. dispense front air segment and front sample volume to waste
- 5. valve to load position and load inject volume
- 6. valve to inject position and start chromatography
- 7. dispense rear sample and air segment to waste
- 8. valve clean with wash liquid 2
- 9. valve clean with wash liquid 1
- 10. active needle wash with wash liquid 1

cycle end

- Clean and efficient removal of carryover in the entire flow path
- Holding loop for effective rinsing of the complete sample path
- Integrated pumps for active wash solvent delivery selectable wash time for organic and aqueous solvents
- Spring loaded syringe needle positioning in needle guide no dead volume
- Existing PAL Systems can be upgraded
- X-Type Syringe based



HTC PAL equipped with DLW Option



SYSTEM

LC/LC-MS General Specifications

System Type

XYZ robot with injection unit

Local User Interface Control panel with 4 function keys, graphical LCD display, unique scroll knob for teach functions

Remote Control Cycle Composer control software Windows 2000 / XP Third party instrument drivers for major LC/LC-MS Systems

Maintenance Accessibility to all maintenance parts from front Preventative maintenance kits available

Electrical Control 1x RS232 / 1 x LAN (with optional PAL-*xt* Electronics) 3x TTL Input 2x Opto Coupler Input 2x Relay Output

Power Requirements 100-240V, 120W, 50/60Hz

Environment 4°C - 40°C constant temperature, < 80% humidity (non condensing)

Weight ~10kg (without accessories)

Electrical Safety Standards CAN/CSA C22.2 No. 61010-1 / ANSI/UL 61010-1 / EN 61010-1

Sample Capacity*

- up to 1400 1ml micro vials
 - 1296 2ml vials
 - 224 10 ml or 20 ml vials
 - 24 deepwell microplates (96/384 wells)
 24 standard microplates (96/384 wells)
 - (* depends on PAL model)

Instrument Options

PAL MALDI Spotter / Fraction Collection

PAL Dilutor

PAL Multi Valve Drives

- PAL Sample StackCooler / TrayCooler
- 4- 6- 10 port Injection and Switching Valves
- UPLC Injection Valves up to 1000 bar / 15'000psi
- PAL Column Selector Valve
- PAL Barcode Reader

Specifications are subject to change without notice

Distributed by:

PAL Broch-IDLW-09

Part No.

To learn more about the

LC/LC-MS sample handling

GC/GC-MS sample injection

systems contact your CTC

unique PAL Series of

systems or any of our

Analytics distributor.



Ordering details

PAL DLW-HTS-xt

- DLW Option including HTS-xt Upgrade Kit
- 1 pc DLW Injection Adapter with sample holding loop and syringe 100μl
- 1 pc Wash Station
- 1 pc Wash Solvent Pump Station with 2 active micro pumps
- 2 pcs 1 Liter Wash Solvent bottles
- 2 pcs Solvent bottle transfer line including PEEK solvent filter 10µm
- 1 pc System CD ROM DLW including Cycles
- 1 pc Manual DLW Option
- 1 pc Kit HTS-xt (Control Board-xt for PAL System -Firmware 4.0.X) Choose this kit if you want to upgrade an existing

HTS PAL to the DLW Option

PAL DLW-HTC-xt

- DLW Option including HTC-xt Upgrade Kit
- 1pc DLW Injection Adapter with sample holding loop and syringe 100µl
- 1 pc Wash Station
- 1 pc Wash Solvent Pump Station with 2 active micro pumps
- 2 pcs 1 Liter Wash Solvent bottles
- 2 pcs Solvent bottle transfer line including PEEK solvent filter 10µm
- 1 pc System CD ROM DLW including Cycles
- 1 pc Manual DLW Option
- 1 pc Kit HTC-xt (Control Board-xt for PAL System -Firmware 4.0.X) Choose this kit if you want to upgrade an existing HTC PAL to the DLW Option

PAL DLW Option*

- DLW Option for fast and clean LC Cycles
- 1pc DLW Injection Adapter with sample holding loop and syringe 100µl
- 1 pc Wash Station
- 1 pc Wash Solvent Pump Station with 2 active micro pumps
- 2 pcs 1 Liter Wash Solvent bottles
- 2 pcs Solvent bottle transfer line including PEEK solvent filter 10µm
- 1 pc System CD ROM DLW including Cycles
- 1 pc Manual DLW Option requires but does not include xt-Upgrade for PAL and Firmware 4.0.X Choose this kit if your PAL is already equipped with the xt-Upgrade
- * only if HTS/HTC is equipped with xt Upgrade

CTC Analytics

Where design meets performance

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