

**TE NUMBER:**

**DESCRIPTION:**



**Fit/Ergonomics**

UUT easily installed & removed.

Test equipment fits installation site/workbench.

Test equipment sized appropriately (width, height and depth).

Controls and/or indicators accessible/visible while UUT is in place.

Test equipment can be easily/safely moved (Design includes handles, if necessary).



**Graphical User Interface**

Display required information and tools (Discuss intended use).

User friendly to operator.



**Serviceability**

Consider repairs and PM/Calibration activities.



**Safety**

- Mechanical (safety/heat/pinch points/sharp edges)

- Electrical (exposed high voltage or current)

- Chemical solvent or fume exposure

Appropriate safety measures in place (shields, interlocks, alarms, labels, etc.).



**Environment**

Components compatible with installation site (temperature, humidity, etc.).



**Cooling**

Sufficient cooling provided via ventilation and/or fan(s). (Avoid adding holes to the top of Tester).



**Electrical**

Power requirements fit intended use, ideally, universal (100-240V 50-60hz) power-compatible.

AC inlet protected with an appropriate fuse.

Design includes 8-32 ground stud(s) for test equipment with AC power.

Robust interface connections (consumable/wear-out/pigtail connectors use where appropriate).



**Sensors/Gauges/Data Acquisition**

Sensor(s), gauge(s) and data acquisition hardware are capable (sufficient resolution, speed, etc.).



**Plumbing**

Minimize number and type of fittings/adapters.

Custom manifolds used only when standard adapters are unavailable.

Consumable/wear-out tubes use where appropriate.

Necessary regulators and gauges are acceptable. Design uses no unnecessary regulators or gauges.



**Communication**

Signal/communication connections universal (Serial/Ethernet/and/or USB) where possible.



**Sustainability**

Design uses current technology, e.g., new design should not require computer ISA slot.

Design uses standard Waters components (valves, pumps, fittings, power supplies, filters, clips, switches, cables) where possible.



**Mechanical Enclosure (Good Design Practice)**

Mechanical parts (including frame, panels\*) symmetrical if possible. Exaggerate asymmetry otherwise.

Features placed on the same centerline, where possible, to simplify drafting and machining.

Threaded holes specified where applicable (4-40 for AC power entry module, AMP CPC connectors, etc.).

Component placement and spacing accommodates standard labels (5/8" or 1" spacing for small or large engraved labels, respectively).

Clip nuts used to attach panels (use 5/16" holes for clip nuts and 1/4" clearance holes for screws).\*

Panel thickness does not exceed 1/8" (unless extra strength required)\*

Minimize number and type of sub-panels and or fasteners.

Design includes four 8-32 threaded holes for rubber feet 5/8" from bottom panel edges\*

Top panel provides a flat surface (fasten panel with flat head screws in 82° countersunk holes).\*

Design on the loose, or LMC side, to simplify fabrication and prevent unnecessary interference, examples:

- Dorlec frame nominally oversized (0.060"), relative to panels.\*
- Normal (or larger) clearance holes used for typical fastening, (e.g., #8 ≥ 0.194" Ø, #10 ≥ 0.221" Ø, etc).

\* This item is specific to aluminum enclosures built using the Dorlec Construction System.

Notes: (Please add list of attendees as and attachment) • Agreed to move forward w/ manual <sup>activation of MSV.</sup> test  
→ in comparison to current MSV drive test.  
• Discussed test time, increase in attended time, decrease total time (15 to 5 minutes)  
• Discussed methanol vs acetonitrile, tightening spec. for methanol?  
• Went over test method + setup and considerations for final packaged design.

Test Engineer:

Tyler Modelski, Tyler Modelski

Date:

02 Feb 2018

Manufacturing Engineer:

Fu & Sun

Date:

02 Feb, 2018

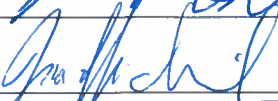
Test Engineering Manager:

Jaffer Ismail Jaffer Ismail

Date:

02 FEB 2018

## Design Review Attendance List

| Printed Name        | Signature                                                                          | Date        |
|---------------------|------------------------------------------------------------------------------------|-------------|
| Tyler Modelski      |  | 02 Feb 2018 |
| Taaffar Ismail      |  | 02 Feb 2018 |
| ADCB to TOMAZ       |  | 02 Feb 2018 |
| PETER KIRBY         |  | 02 FEB 2018 |
| FRED SHARIFI        |  | 02 FEB 2018 |
| Matthew Bule        |  | 02 FEB 2018 |
| Adam Townsend       |   | 02 Feb 2018 |
| Richard Davis       |  | 02 Feb 2018 |
| N/A TJM 02 Feb 2018 |                                                                                    |             |
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