

PCS Instruments

LEADERS IN TRIBOLOGY TEST EQUIPMENT



2024 HFRR Features

Feature	Previous HFRR	2024 HFRR
Sleek, modern aesthetic		
Physical features		
Fully insulated chamber	With optional humidity cabinet and insulation set	
Active ambient humidity control	Humidity cabinet (sold separately) uses salt solution to control humidity	
Active ambient temperature control	Requires separate temperature control unit	
Minimised bench space	Separate desktop PC, monitor, keyboard, mouse and control unit	
Stowable chamber door		
Compatible with existing gasoline conversion kit		
Frequency test port		
Customisable RGB chamber light		
All relevant standards fully integrated	ASTM D6079, ASTM D7688, ISO 12156, CEC F-06-A and IP 450	ASTM D6079, ASTM D7688, ISO 12156, CEC F-06-A and IP 450
PC control	Desktop PC and monitor sold separately	
Selectable 'Test in progress' views		
Calibration sequences with on screen video instructions		
Touchscreen based software		
Inline software help		
Automated, customisable test report generation	Single test report format	
LIMS Integration	Basic export of test data	
In-built database for storage of test data		
QR Scanning		
User Access Control		
Compatible with existing wear scar camera and microscope		
Software features		

Fully Insulated chamber

The new climate chamber is fully insulated and equipped with active humidity and temperature control, ensuring that consistent environmental conditions are maintained around the HFRR mechanical unit even under extreme laboratory conditions. This setup meets the stringent requirements of ISO 12156:2023.



Sleek modern aesthetic

The new climate chamber has a fully stainless-steel interior making it easy to wipe clean. The compact, moulded enclosure contains all the functions of the HFRR system.



Stowable chamber door

A double glazed, insulated climate chamber door neatly slides into a pocket in the side of the chamber housing. This gives excellent access to the chamber for cleaning and specimen changes while keeping the door out of the way when not in use, such as during gasoline tests.

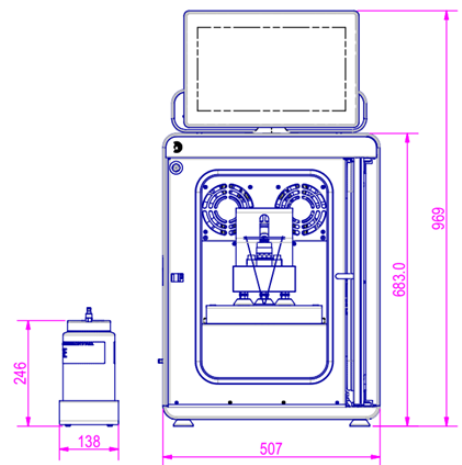
Minimised bench space

The 2024 HFRR integrates many features that were previously optional or in separate, bench space consuming boxes.

The climate chamber controls the humidity and temperature around the HFRR mechanical unit and contains an integrated control system for running the HFRR test. The system's power supply can be mounted on top of the climate chamber, behind the new touch screen panel PC.

Two water bottles, one containing de-ionised water and one for wastewater (used for humidity control), are placed to the side of the chamber in a bespoke stainless-steel stand.

Total bench requirements (h x w x d): 970 x 650 x 750mm
Weight: 113.5kg / 250lb



Dimensions in mm

Compatible with existing gasoline conversion kit

The existing gasoline conversion kit can be fitted to the HFRR's mechanical unit, allowing gasoline testing to be performed. For such tests, the chamber door is pushed on rails into a pocket in the chamber housing.

Active chamber humidity control

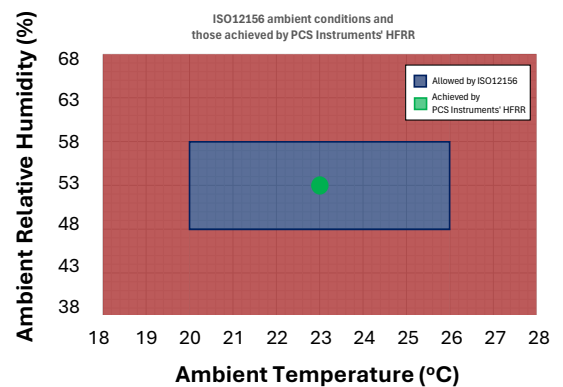
The integrated climate chamber precisely and actively controls the humidity in the chamber using only water; no more salt solutions. A small amount (40 ml per test) of de-ionised water is automatically drawn into the chamber at the beginning of a test from a water reservoir housed at the side of the environmental chamber. Water from the previous test is also automatically drained into a waste bottle, ensuring no cross contamination between tests.

Upon starting a test sequence, the chamber door is closed and the humidity is automatically controlled to the correct level for the test standard being followed. The HFRR test is automatically started only after the chamber conditions are stabilised. Chamber conditions are precisely and actively maintained for the duration of the test.

The reservoir and waste bottles require filling and emptying, respectively, every 20 to 40 tests.

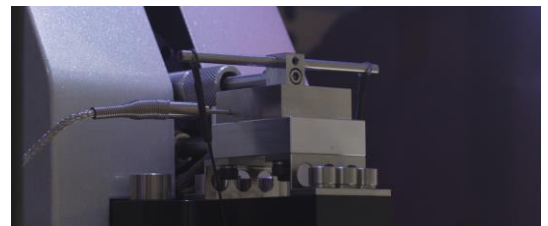
Active chamber temperature control

The integrated climate chamber actively heats or cools the chamber to the temperature required by the test standard being followed, ensuring consistent conditions around the mechanical unit, regardless of ambient environmental conditions. As with humidity, the HFRR test is automatically started only after the conditions are stabilised. They are then maintained precisely by the HFRR's control system throughout the test. Solid state Peltier heater/coolers are used throughout the system.



Customisable RGB chamber light

The environmental chamber contains RGB LEDs, whose colours can be configured to reflect stages in a test, including, but not limited to, pre-test stabilisation, test in progress and test completed. This gives a quick and easy indication of the status of a test in a busy laboratory environment, as well as giving good illumination of the mechanical unit whilst a test is being set up.



Frequency test port

For users wishing to verify the frequency of the HFRR's vibrator (as required by certain test standards), the HFRR now includes a dedicated frequency test port, located inside the door of the environmental chamber. Using the optional Frequency Test Kit, and an on-screen test sequence, the user can simply and accurately verify the instrument's vibration frequency without the need to remove the mechanical unit's cover.

PC control

The 2024 HFRR is supplied with a high resolution (1080p) touch screen panel PC that is mounted to the top of the environmental chamber. New, intuitive touch-based software simplifies the process of running a test and calibrating the instrument. It also includes a built-in high-capacity test database for storage of all test data.

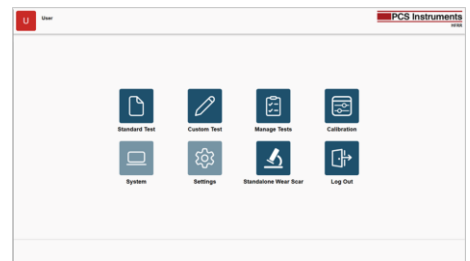


Touchscreen based software

The user interface of the software has been completely redesigned, focussing on touch use. The capacitive touch screen is wipe clean and works with laboratory gloves.

An intuitive menu system and test sequence guides the user through every step of the test, helping to ensure that all stages are performed consistently.

The lack of the requirement for a keyboard and mouse (although these are also supported if preferred) also save additional bench space.

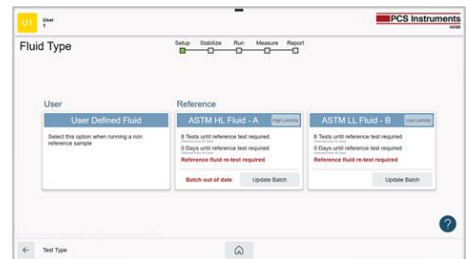


All test standards built in

The new software builds in full support for all relevant test standards, specifically ASTM D6079, ASTM D7688, CEC F-06-A, ISO 12156 and IP 450.

Certain HFRR test standards have requirements on the time or number of tests (or both) between tests run using reference fluids. The HFRR automatically tracks this, informing the user when a reference test is required and if the reference fluid has passed the end of its reference period.

When running a 'Standard Test', the required ambient test conditions for the selected standard are preloaded. The controller precisely controls these for the duration of the test.



Selectable 'Test in progress' views

During a test, there are several ways in which the live test data can be viewed. A very useful view is a large countdown timer that shows the time remaining for the test. Another view shows dial indicators for all the data collected during a test. This data can also be viewed as a chart.



Calibration sequences with on-screen video instructions

Building on the existing calibration sequences of the HFRR, the 2024 HFRR adds step by step video clips demonstrating all stages of the instrument's calibration, making it simple to perform consistent and accurate calibrations.

The calibration summary view shows the current calibration of the instrument and the calibration log gives a full calibration history of the instrument.



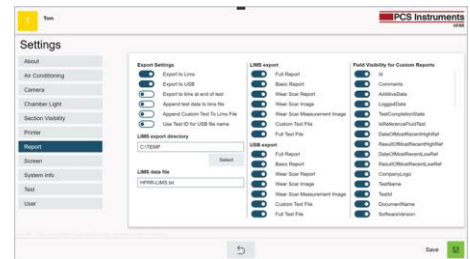
Automated, customisable test report generation

On completion of a test and measurement of the associated wear scar, a test report is automatically generated. When a 'Standard Test' is used, a test report format specific to that standard is used, ensuring that the test results are presented exactly as required by the specific test standard.



LIMS integration

The 2024 HFRR gives extensive customisation options for the export of test data. Alongside the A4 PDF test report, additional PDF and text export formats are available as well as any associated wear scar image, with or without measurement line annotations. The text report's content can be entirely customised from within the software's options menu. The chosen test data can also be set to automatically export to a local or networked LIMS folder at the end of a test sequence.

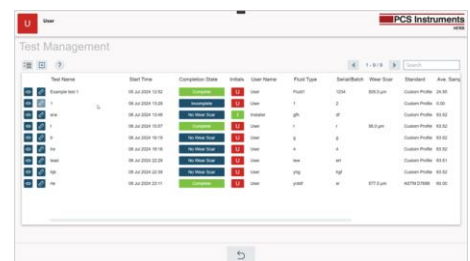


In-built test database

The HFRR's software contains a test database which stores all previous test data from the instrument. Tests can be searched, exported and viewed. A 'completion state' field shows if the test was completed successfully, if it has an associated wear scar, or if it was a test using a reference fluid.

Wear scar measurements can also be added to tests that have been previously completed.

Access to the database can be limited such that a user can only view test data for tests they have run.



Inline software help

Help buttons are present throughout the software, with photos, text and videos explaining each software process. For example, the test setup sequence has a help button that gives the option of viewing a video that shows the entire test setup process.

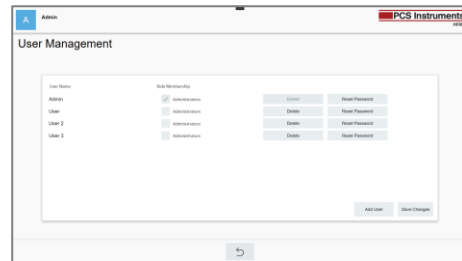
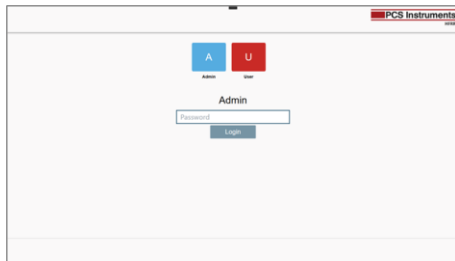
QR scanning

An optional webcam style camera can be attached to the system to allow scanning of specimen and reference fluid batch information. This can speed up data entry at the beginning of a test and reduce keying errors.



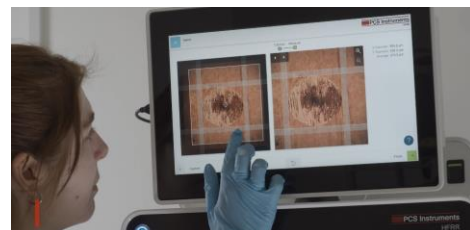
User access control

Each user has their own profile in the HFRR software. Different access levels are available to limit a user's ability to calibrate the instrument or view other user's test data. Password controlled access to the software can also be enabled by an administrator.



Compatible with existing wear scar camera and microscope

Customers with existing wear scar microscopes and wear scar cameras can continue to use these with the 2024 HFRR. A new license file will be provided which can easily be imported into the new software using either QR code or USB.



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Leaders in tribology test equipment

Designing and manufacturing equipment for the testing of fuels and lubricants.

