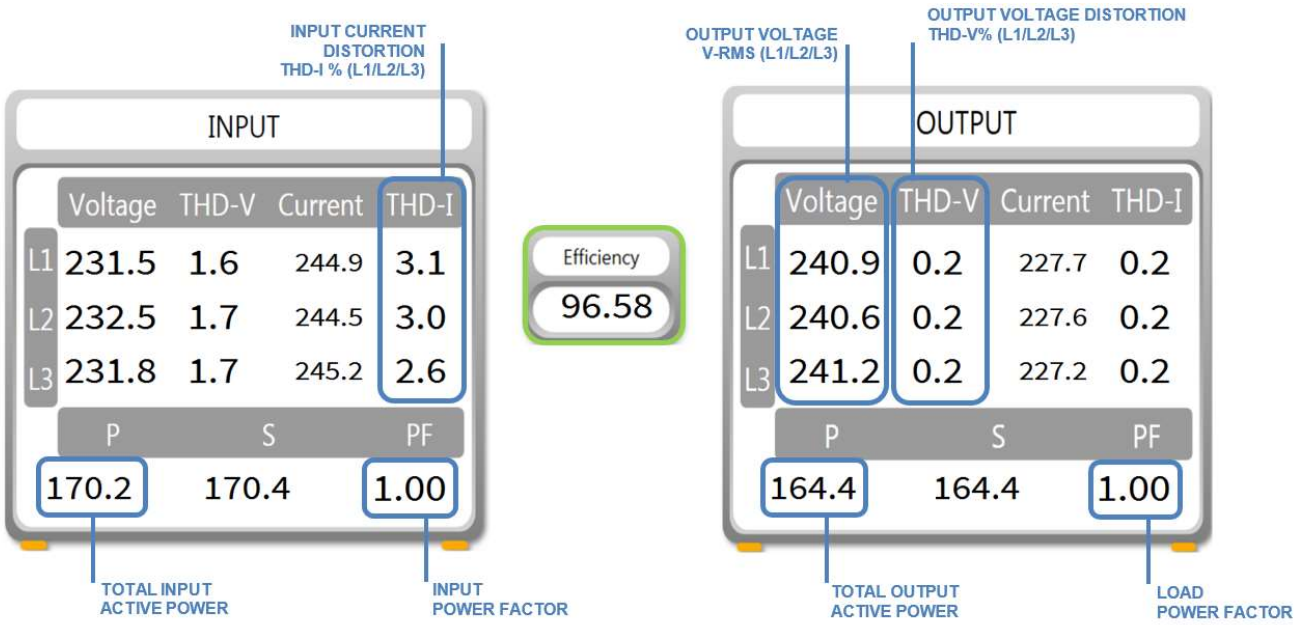
ATTESTATION

BV 22450699-1/02/AK

PRODUCT :	*Delphys XL*
POWER RANGE :	*1000 - 1200 kVA*
INSPECTION ORDERED BY :	*SOCOMEC* *11, route de Strasbourg - 67235 HUTTENHEIM - FRANCE*
SUPPLIER / MANUFACTURER :	*SOCOMEC* *11, route de Strasbourg - 67235 HUTTENHEIM - FRANCE*
PURCHASE ORDER N° :	*3GC020833 dated 29/05/2024*
TESTED PRODUCT :	*Delphys XL 1200 kVA / kW* *Serial number: 22100HGTC00163001*
TESTED CONDITIONS :	*Tested in our presence in Socomec's Tests Laboratories at Huttenheim,* *Tested according to UPS Standard IEC62040-3 dated 2021-04 (Uninterruptible power systems - Part 3: Method of specifying the performance and test requirements)* *CONTROL operations carried out with certified measurement tools, and stabilized conditions.*
Attendance:	*Load step from 0 to 100% in double conversion mode* • *Resistive Load - 100% load rate* *Attendance to Input voltage* *Attendance to Input Power* *Attendance to Input Current Total Harmonic Distortion.* *Attendance to Input Voltage Total Harmonic Distortion.* *Attendance to Input Power factor.* *Attendance to Output voltage* *Attendance to Output Power*
ENCLOSURES:	*See pages 3 to 7*

The undersigned, **A.KINNEN from BUREAU VERITAS**, acting within the scope of the general conditions of the Industrial Branch -mentioned overleaf- certifies that the above inspection was performed in the Tests Laboratories of SOCOMEC UPS at Huttenheim, from on 27th May 2024 : see synthesis pages 3 to 7

MEASUREMENTS FOCUS



INPUT MEASUREMENT FOCUS WHEN WORKING IN DOUBLE CONVERSION

INPUT CURRENT DISTORTION (THD_I %): Current absorption generated by the rectifiers
INPUT POWER FACTOR: Input Power factor of the rectifiers.
TOTAL INPUT ACTIVE POWER: Active power required to supply the output power

OUTPUT MEASUREMENT FOCUS WHEN WORKING IN DOUBLE CONVERSION

OUTPUT VOLTAGE DISTORTION (THD_V %): Voltage quality created by the system.
OUTPUT VOLTAGE (V_RMS): RMS Voltage created by the system inverters
OUTPUT POWER FACTOR: Power factor of the load
TOTAL OUTPUT ACTIVE POWER: Active power consumed by the load

EFFICIENCY

EFFICIENCY = OUTPUT Active Power / INPUT Active power

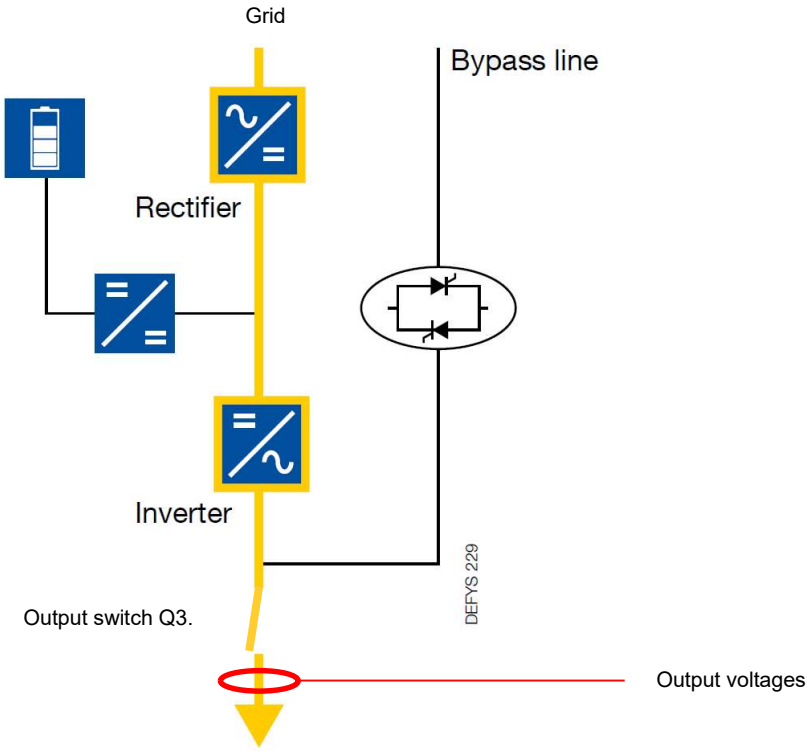
MEASUREMENTS

All the measurements are done on the complete system.

Performances in double conversion mode (VFI)

Initial condition: UPS working at 0% of load rate in double conversion mode – output switch Q3 opens.

Test performed: Close the output switch in order to apply a 100% load step to the UPS.



Objective: Demonstrate that the output voltages supplying the critical loads are compliant with the most restrictive dynamic performances - IEC 62040-3 Class 1

The **UPS output voltage** remains within the limits of Figure 2.

NOTE Such performance is required by sensitive critical loads.

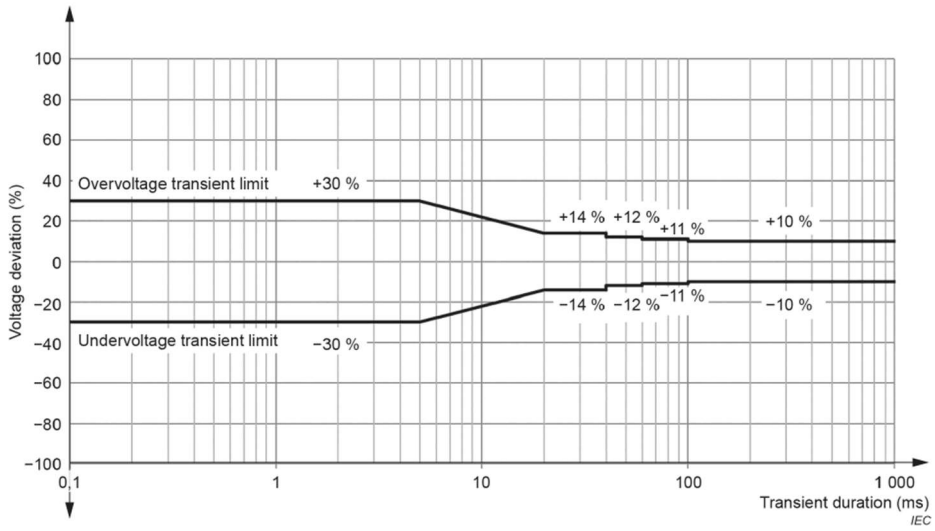


Figure 2 – Dynamic output performance class 1

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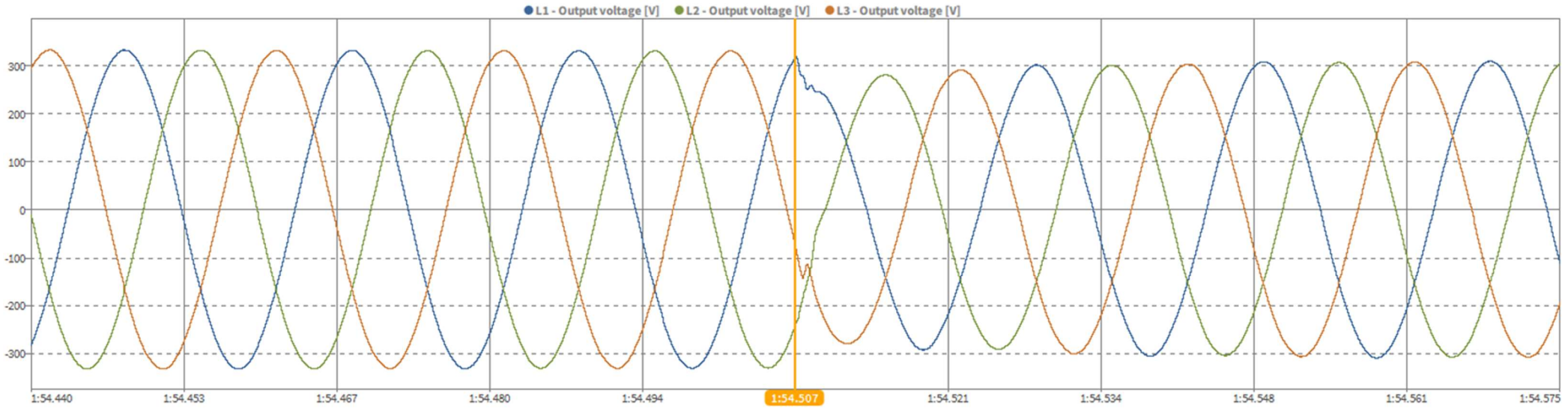
Curve



Output voltage L1
Output voltage L2
Output voltage L3

Load impact 0-100% - Double conversion mode

INPUT

	Voltage	THD-V	Current	THD-I
L1	232.2	2.7	1796.4	1.7
L2	233.4	2.6	1798.3	1.6
L3	233.5	2.6	1792.3	1.5

P	S	PF
1254.7	1255.4	1.00

OUTPUT

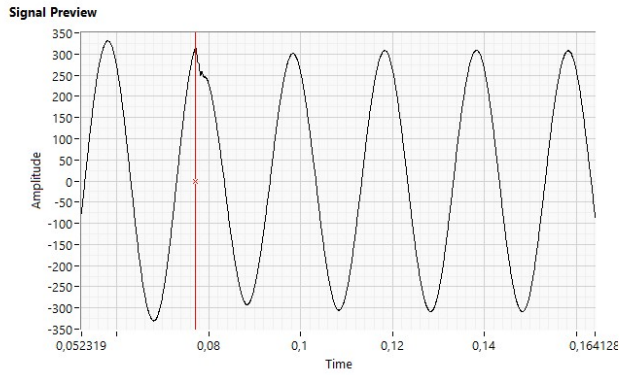
	Voltage	THD-V	Current	THD-I
L1	231.3	0.3	1725.5	0.2
L2	231.1	0.3	1731.5	0.2
L3	231.5	0.3	1733.8	0.2

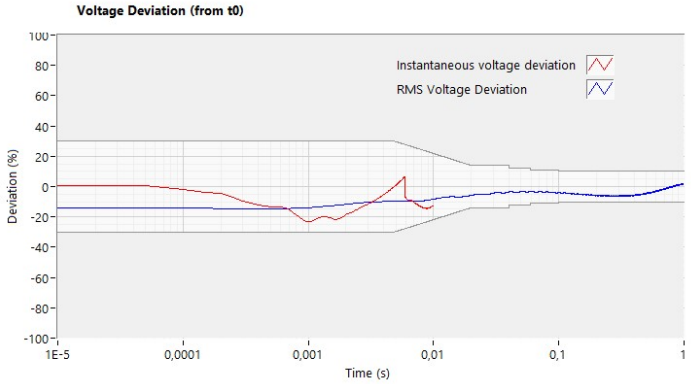
P	S	PF
1200.3	1200.6	1.00

Output voltage analysis.

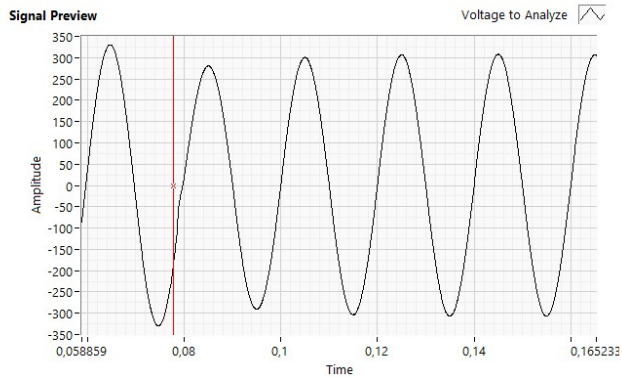
The output voltages deviations are compared with the dynamic output performance class 1 requirement in the standard 62040-3

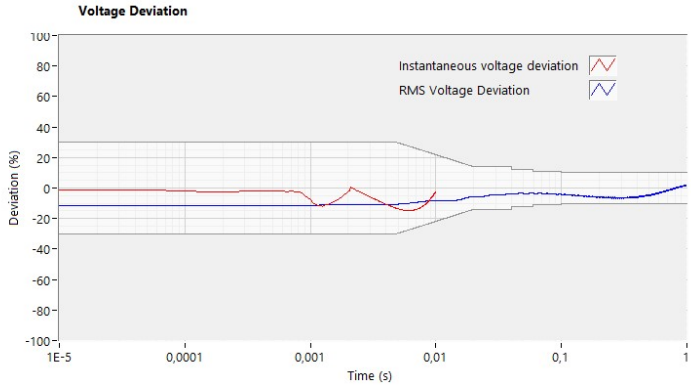
Phase 1



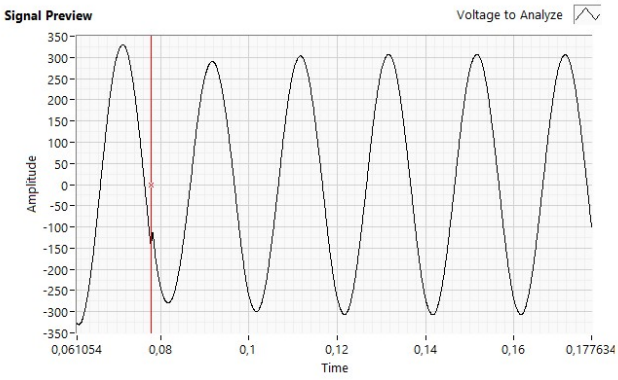


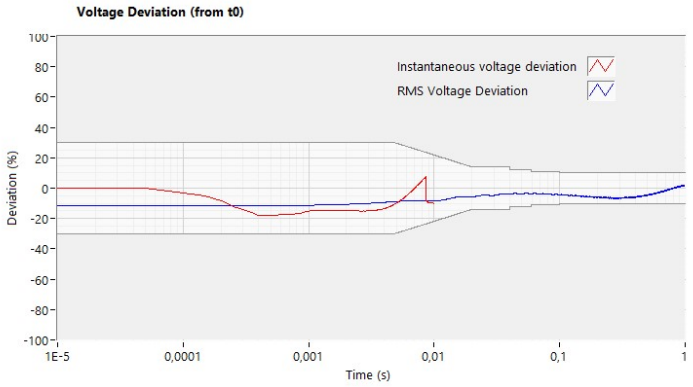
Phase 2





Phase 3





Conclusion

Delphys XL is able to perform a 0 to 100% load step with a dynamic output performance respecting the most restrictive class 1 requirement based on the standard IEC 62040-3

Metrology

Measuring device	Brand	Metrology Number	Metrology limit
Data acquisition system	Dewetron	CDM/M/23001	01/2025
Current sensor input L1	Chauvin Arnoud	PAM/M/23016	04/2025
Current sensor input L2	Chauvin Arnoud	PAM/M/23015	04/2025
Current sensor input L3	Chauvin Arnoud	PAM/M/23018	04/2025
Current sensor output L1	Chauvin Arnoud	PAM/M/23020	04/2025
Current sensor output L2	Chauvin Arnoud	PAM/M/23017	04/2025
Current sensor output L3	Chauvin Arnoud	PAM/M/23016	04/2025
Current sensor bypass L3	Chauvin Arnoud	PAM/M/22041	11/2024

Issued at Huttenheim, on 27th May 2024

The surveyor: A.KINNEN