



EMC Test Report

**Related to CE Directive: 2014/30/EU Electromagnetic
Compatibility Directive
Report Number: H(18)080601ER
Date: Aug. 06, 2018**

Applicant : Zhejiang H-WISE Technology Co., Ltd.

Address : No. 88 Yexin Road, Ganyao Industrial Park, Jiashan, Zhejiang,
China(314107).

Trade mark : /

Product name: AC Drive/Inverters

Model(s): H300, H500, H600, H700, H900.

According to : EN 61800-3:2004+A1:2012

TEST REPORT FOR COMPLIANCE WITH

EN 61800-3:2004+A1:2012 Adjustable speed electrical power drive systems —Part 3: EMC requirements and specific test methods

Registered Number		
Applicant	Zhejiang H-WISE Technology Co., Ltd.	
Applicant Address	No. 88 Yexin Road, Ganyao Industrial Park, Jiashan, Zhejiang, China(314107).	
Trade mark :		
Machinery		
Product Name	AC Drive/Inverters	
Main Model	H300	
Series Model(s)	H300, H500, H600, H700, H900.	
File No.	H(18)080601ER	
Directive	2014/30/EU Electromagnetic Compatibility Directive	
Standards Compliance	EN 61800-3:2004+A1:2012	
Date of Testing	Aug. 06, 2018	
Testing Laboratory	Shanghai Biaotong Testing Technology Service Co., Ltd No.11, Lane 225, Jinxiang Road, Jinqiao Pudong, Shanghai, China.	
Tested by	Stone Lee	<i>Stone Lee</i>
Approved by	Jack Yang	<i>Jack Yang</i>



Test item particulars:
Type of item tested.....: EMC evaluation
Description of equipment function.....: AC Drive/Inverters
Overall size of the equipment (L x W x H).....: See general products information
Mass of the equipment (kg).....: See general products information
Accessories and detachable parts included in the evaluation.....: —
Option.....: —
Test case verdicts:
Test case does not apply to the test object.....: N(N/A)
Test object does meet the requirement.....: P(Pass)
Test object does not meet the requirement.....: F(Fail)
General Remarks:
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The test results presented in this report relate only to the item(s) tested.
Copy of Marking Plate:

EN 61800-3:2004+A1:2012 test report

Clause	Requirements EN 61800-3:2004+A1:2012	Result-Remark	Verdict
1	Scope and object		N
2	Normative references		N
3	Terms and definitions		N
4	Common requirements		N
4.1	General conditions		N
	All phenomena, from the emission or immunity point of view, shall be considered individually. The limits are given for conditions which do not consider the cumulative effects of different phenomena		P
	For a realistic assessment of the EMC situation, a typical configuration shall be chosen. The application of tests for evaluation of immunity depends on the particular PDS, its configuration, its ports, its technology and its operating conditions (see annexes).		P
4.2	Tests		N
4.2.1	Conditions		N
	IEC 60146-1-1 and IEC 61800-2 distinguish between type test, routine test and special test. Unless otherwise stated, all the tests specified in this standard are type tests only. The equipment shall meet the EMC requirements when measured by the test methods specified in this standard		P
	If necessary, safeguards shall be taken against any unintended effects on the total process that may result from an equipment failure while an EMC test is being conducted.		P
	For the tests, the CDM shall be connected to a motor recommended by the manufacturer with a cable and earthing rules defined by the		P

Clause	Requirements EN 61800-3:2004+A1:2012	Result-Remark	Verdict
	manufacturer. Alternatively, a passive test load (resistive, or resistive and inductive) may be applied (for example, for evaluation of the lowfrequency emissions), if permitted by the manufacturer.		
	The description of the tests, the test methods, the characteristics of the tests and the test setups are given in the referred standards and are not repeated here. If, however, modifications or additional requirements and information or specific test methods are needed for practical implementation and application of the tests, then they are given in this standard.		P
4.2.2	Test report		N
	The test results shall be documented in a test report. The report shall clearly and unambiguously present all relevant information of the tests (for example: load conditions, cable laying, etc.). A functional description and detailed acceptance criteria provided by the manufacturer shall be noted in the test report		P
	Within the test report, the chosen test arrangements shall be justified. A sufficient number of terminals shall be selected to simulate actual operating conditions and to ensure that all relevant types of termination are covered. The tests shall be carried out at the rated supply voltage and in a reproducible manner.		P
4.3	Documentation for the user		N
	The setting of limits and the structure of this standard are based on the understanding that the installer and user are responsible for following the EMC recommendations of the manufacturer		P
	The manufacturer shall supply the		P

Clause	Requirements EN 61800-3:2004+A1:2012	Result-Remark	Verdict
	documentation necessary for the correct installation of a BDM, CDM or PDS into a typical system or process in the intended environment. This information includes any emission warnings required by 6.1 and Table 13. It also includes the warnings required by 5.3.2 in the case where the immunity of a BDM, CDM or PDS is not suitable for the second environment.		
	If special EMC measures are necessary to fulfil the required limits, these shall be clearly stated in the user documentation. Where relevant, these can include:		N
	maximum and minimum acceptable supply network impedance; – the use of shielded or special cables (power and/or control); – cable shield connection requirements; – maximum permissible cable length; – cable segregation; – the use of external devices such as filters; – the correct bonding to functional earth.		P
	If different devices or connection requirements apply in different environments, this shall also be stated.		P
	A list of auxiliary equipment (for example, options or enhancements) that can be added to the PDS, and which complies with the immunity and/or emission requirements shall be made available. This information may also be covered in some part of the test report to clarify the final recommended arrangement		P
5	Immunity requirements		N
5.1	General conditions		N
5.1.1	Acceptance criteria (performance criteria)		N

Clause	Requirements EN 61800-3:2004+A1:2012	Result-Remark	Verdict
	The system performance relates to the functions of the BDM, or of the CDM, or of the PDS as a whole, that are declared by the manufacturer		P
	The sub-component performance relates to the functions of the sub-components of the BDM, or of the CDM, or of the PDS, that are declared by the manufacturer.		P
	The sub-component performance may be tested as an alternative instead of the system performance to show immunity (see 5.1.2).		P
	Although this part of IEC 61800 allows tests on sub-components (components of CDM/BDM), it is not intended to be used for the separate conformity assessment of sub-components.		P
	The acceptance criteria shall be used to check the performance of a PDS against external disturbances. From the EMC point of view any installation, according to Figure 1, shall be running properly. Since a PDS is part of the functional sequence of a larger process than the PDS itself, the effect on this process caused by changes in the performance of the PDS is hard to forecast. However, this important aspect for large systems should be covered by an EMC plan (see Annex E).		P
	The main functions of a PDS are energy conversion between the electrical form and the mechanical form, and the information processing necessary to perform this. Table 1 classifies the effects of a given disturbance into three acceptance (performance) criteria: A, B and C, both for the PDS and for its sub-components.		P
5.1.2	Selection of performance type		N
5.1.2.1	General or special system performance		N
	The “general system performance” item from		P

Clause	Requirements EN 61800-3:2004+A1:2012	Result-Remark	Verdict
	Table 1 shall be defined in accordance with the special application and typical configuration of the PDS. It is the responsibility of the manufacturer to select these items.		
	The special system performance, torque-generating behaviour, shall be tested only in cases where it is explicitly defined in the product specification. In this case, the torque generating performance can be directly or indirectly tested. The direct test uses an EMC immune torquemeter to measure torque disturbances		P
	Torque performance can be defined through the ability to keep current or speed constant, within specified tolerances, when a disturbance is applied (see also 5.1.3). Therefore, a test of current performance can be used as an indirect test of torque-generating performance. For EMC assessment, and unless otherwise agreed, the output current of the power converter is deemed to represent torque with sufficient accuracy. As an alternative, the indirect test can use speed performance provided the total inertia is specified.		P
5.1.2.2	Sub-component performance		N
	Testing of sub-components with sub-component performance should be used in cases when a PDS cannot be put into service on a test site because of limitation on the physical size of the PDS, on the current or rated supply capability or load conditions. In any case, the test set-up shall be immune to the highest level of disturbance applied to the PDS or to the subcomponent under test.		P
	Testing of information processing and sensing		P

Clause	Requirements EN 61800-3:2004+A1:2012	Result-Remark	Verdict
	functions, including optional accessories if any, shall be performed only in cases where the relevant ports or interfaces are available at the PDS. Testing of the sub-component performance, according to Table 1, where the functions exist, is sufficient to determine the compliance with this standard.		
5.1.3	Conditions during the test		N
	The load shall be within the manufacturer's specification and the actual load shall be noted in the test report.		P
	Testing the torque generating behaviour as well as the information processing and sensing functions requires special test equipment with adapted immunity against the parasitic coupling of the test disturbance. It can only be used if the immunity of the test set-up can be proven by reference measurements. The evaluation of the torque disturbance can be performed by a torque transducer or by measurement or calculation of the torque generating current or other indirect techniques; an adapted and immune load shall be available at the test-site.		P
	For testing the performance of the information processing or sensing function, suitable equipment shall be available to simulate the data communication or data evaluation. This equipment shall have sufficient immunity to operate correctly during the test		P
	Since the motor has been tested by its manufacturer according to the relevant standards, the motor component of the PDS, with exception of the sensors, does not need any additional EMC immunity test. Therefore, while the motor is connected to the BDM/CDM for the duration		P

Clause	Requirements EN 61800-3:2004+A1:2012	Result-Remark	Verdict
	of the test, EMC immunity tests on the motor itself are not required.		
	The tests shall be applied to the relevant ports where they exist, including those of optional accessories if any. They shall be conducted in a well-defined and reproducible manner on a port-by-port basis. However, if several process measurement and control ports or signal interfaces have the same physical configuration (layout) it is sufficient to test one port or interface of that type.		P
	In 5.2 and 5.3 the minimum requirements, tests and acceptance criteria are stated. The acceptance criteria refer to 5.1.1.		P
5.2	Basic immunity requirements – low-frequency disturbances		N
5.2.1	Common principle		N
	The requirements in this subclause shall be used for designing the immunity of a PDS against low-frequency disturbances. For the immunity requirements, the manufacturer may demonstrate compliance using either testing, calculation or simulation. Unless otherwise stated, it is sufficient to demonstrate that the power circuit will comply with the required acceptance criterion and that the ratings of input circuits (filters, etc.) will not be exceeded		P
	The compliance with the requirements of this part of IEC 61800 shall be stated in the user documentation. Where compliance is demonstrated by tests, the relevant basic standard in the IEC 61000-4 series may be considered (see Clause B.7).		P
5.2.2	Harmonics and commutation notches/voltage		N

Clause	Requirements EN 61800-3:2004+A1:2012	Result-Remark	Verdict
	distortion		
5.2.2.1	Low voltage PDSs – (voltage distortion)		N
	The BDM, CDM or PDS shall sustain the immunity levels while meeting the performance criteria given in Tables 23, 24 and 25. It shall be verified that these levels will not cause the ratings for the input circuits (filters, etc.) to be exceeded. Analysis of commutation notches shall be in the time domain. The manufacturer may verify immunity by calculation, simulation, or test, according to 5.2.1. If the chosen verification method is by test, it shall be performed using the PDS with the motor connected. For equipment rated below 16 A per phase, the test method of IEC 61000-4-13 can be applied.		P
5.2.2.2	PDSs of rated voltage above 1 000 V – (voltage distortion)		N
5.2.2.2.1	Main power port		N
	The PDS or BDM/CDM shall sustain the immunity levels given in Table 3. It shall be verified that these levels will not cause the ratings for the input circuits (filters, etc.) to be exceeded. Analysis of commutation notches shall be in the time domain. The manufacturer may verify immunity by calculation, simulation, or test, according to 5.2.1		P
5.2.2.2.2	Auxiliary power port		N
	The auxiliary power ports of PDSs shall sustain the immunity levels for the second environment given in Tables 23, 24 and 25 while meeting the performance criteria in those tables. It shall be verified that these levels will not		P

Clause	Requirements EN 61800-3:2004+A1:2012	Result-Remark	Verdict
	<p>cause the ratings for the input circuits (filters, etc.) to be exceeded. Analysis of commutation notches shall be in the time domain.</p> <p>The manufacturer may verify immunity by calculation, simulation, or test, according to 5.2.1.</p>		
5.2.3	Voltage deviations , dips and short interruptions		N
5.2.3.1	Low voltage PDSs (voltage deviations)		N
	<p>The PDS or BDM/CDM shall sustain the immunity levels given in Table 5. The manufacturer may verify immunity by calculation, simulation, or test, according to 5.2.1.</p>		P
	<p>Where it is possible and not dangerous, the behaviour of the PDS during short interruptions may be verified by switching off and on the mains supply during the standard operating conditions of the PDS (see B.6.1).</p> <p>The manufacturer shall state in the user documentation the degradation of performance resulting from voltage dips or short interruptions.</p>		P
5.2.3.2	PDSs of rated voltage above 1 000 V (voltage deviations)		N
5.2.3.2.1	Main power port		N
	<p>Main power ports of PDSs shall sustain the immunity levels given in Table 6. The manufacturer may verify immunity by calculation, simulation, or test, according to 5.2.1. The manufacturer shall state in the user documentation the degradation of performance resulting from voltage dips or short interruptions.</p>		N
5.2.3.2.2	Auxiliary power port		N
	The auxiliary power ports of PDSs shall sustain		N

Clause	Requirements EN 61800-3:2004+A1:2012	Result-Remark	Verdict
	the immunity levels given in Table 7. The manufacturer may verify immunity by calculation, simulation, or test.		
5.2.4	Voltage unbalance and frequency variations		N
5.2.4.1	Low voltage PDSs		N
	Definition and assessment of voltage unbalance are explained in B.5.2.		P
5.2.4.2	PDSs of rated voltage above 1 000 V		N
5.2.4.2.2	Auxiliary power port		N
	Definition and assessment of voltage unbalance are explained in B.5.2. The auxiliary power ports of PDSs shall sustain the immunity levels given in Table 10. The manufacturer may verify immunity by calculation, simulation, or test		P
5.2.5	Supply influences – Magnetic fields		N
	Immunity tests according to IEC 61000-4-8 are not required (see A.3.1 for explanation).		P
5.3	Basic immunity requirements – High-frequency disturbances		P
5.3.1	Conditions		N
	In the following Table 11 and Table 12, the minimum immunity requirements for highfrequency disturbance tests, and acceptance criteria are stated. The acceptance criteria refer to 5.1.1. Explanations are given in Clause A.3.		P
5.3.2	First environment		N
	The levels in Table 11 shall be applied to PDSs which are intended to be used in the first environment. If a CDM/BDM is designed to have immunity according to Table 11, it shall include a written warning in the instructions for use which		P

Clause	Requirements EN 61800-3:2004+A1:2012	Result-Remark	Verdict
	indicates that it is not intended to be used in an industrial installation.		
5.3.3	Second environment		N
	The levels in Table 12 shall be applied to PDSs which are intended to be used in the second environment. This also applies to the low voltage ports, or the low voltage interfaces (power, signal) of PDSs of rated voltage above 1 000 V.		P
5.3.4	Immunity against electromagnetic fields		N
	If the PDS is:		N
	<ul style="list-style-type: none"> – of rated voltage not more than 500 V; – of rated current not more than 200 A; – of total mass not more than 250 kg, and – of height, width, and depth not more than 1,9 m 		P
	<p>the tests of IEC 61000-4-3 and IEC 61000-4-6 shall be performed, see 5.3.2 and 5.3.3.</p> <p>If the PDS is larger or of higher rating than in the above paragraph then the manufacturer shall choose either:</p>		P
	<ul style="list-style-type: none"> – to perform the tests of IEC 61000-4-3 and IEC 61000-4-6 on the PDS or – to perform the tests of IEC 61000-4-3 and IEC 61000-4-6 on sensitive sub-components 		P
	If the motor is too large to be put into service on a test site, the motor may be replaced by one of smaller size, provided this does not adversely affect the operation of the CDM/BDM		P
	In the case where only sub-components have been tested, a test against radio-communication devices of common industrial use should be performed on the complete PDS, as described in A.3.2.2. This test is only valid for the specific location, installed equipment and frequencies tested.		P
5.4	Application of immunity requirements – statistical aspect		P

Clause	Requirements EN 61800-3:2004+A1:2012	Result-Remark	Verdict
	When choosing the acceptance level for a specific test of a PDS, it shall be understood that the test result implies only a probability of performance. Depending on the acceptance criterion and the application of a PDS, this probability shall be considered in specifying the number of test pulses or duration of the test.		P
	Immunity requirements in 5.3 shall be verified by performing a type-test on a representative unit. The manufacturer or supplier shall ensure the EMC performance of the product is maintained in production by using some form of quality control		P
	Measurement results obtained for a PDS while installed in its place of use (not on a test site) shall relate to that installation only.		P
6	Emission		N
6.1	General emission requirements		N
	The measurements shall be made in the operating mode producing the largest emission in the frequency band, while being consistent with the normal application.		P
6.2	Basic low-frequency emission limits		N
6.2.1	Compliance method		N
	Compliance can be verified by calculation, simulation or test		P
6.2.2	Commutation notches		N
	Commutation notches are measured on the power ports using an oscilloscope (see B.1.1). They are produced by controlled line-commutated converters (see 2.5.4.1 of IEC 60146-1-1). Where it is known that the input circuit of the PDS does not produce notches or only produces notches of negligible amplitude (for example		P

Clause	Requirements EN 61800-3:2004+A1:2012	Result-Remark	Verdict
	diode rectifiers), emission of notches need not be considered		
	Where notches are to be considered, the manufacturer shall provide the following information to the user:		N
	value of any decoupling reactances which are included in the PDS; – available decoupling reactances which can be externally added for mitigation (see B.1.2). The recommendations of B.1.3 should be followed		P
6.2.3	Harmonics and interharmonics		N
6.2.3.1	Low-voltage public supply network – Equipment covered by IEC 61000-3-2		N
	Equipment may contain one or several PDSs and also other loads. When a PDS within the scope of IEC 61000-3-2, the requirements of that standard apply. However, when one or more PDSs are included in equipment within the scope of IEC 61000-3-2, the requirements of that standard apply to the complete equipment and not to the individual PDS. It is the responsibility of the equipment manufacturer to define the boundary of the system or sub-system to which IEC 61000-3-2 applies, and the method which demonstrates compliance of the equipment.		P
6.2.4	Voltage fluctuations		N
6.2.4.1	Conditions		N
	An equipment may contain one or several PDSs and also other loads which are capable of causing voltage fluctuations		P
6.2.4.2	PDS in the scope of IEC 61000-3-3 and IEC 61000-3-11		N
	When a PDS is within the scope of IEC 61000-3-3, the requirements of that		P

Clause	Requirements EN 61800-3:2004+A1:2012	Result-Remark	Verdict
	standard apply. However, when one or more PDSs are included in equipment within the scope of IEC 61000-3-3, the requirements of that standard apply to the complete equipment and not to the individual PDS		
6.2.5	Common mode harmonic emission (low-frequency common mode voltage		N
	The switching frequency of the converter of the PDS is often in the audible frequency range and, in particular, the frequency range commonly used by telephone and data systems. To avoid the risk of crosstalk to signal cables, the installation instructions shall either recommend that the power interface cable be segregated from signal cables or state alternative mitigation methods.		P
6.3	Conditions related to high-frequency emission measurement		N
6.3.1	General requirements		N
6.3.1.1	Common conditions		N
	The rate of change of voltage or current is expected to be the main source of high-frequency emission. For this type of emission the dv/dt values of the PDS are mostly relevant and these can be achieved with output currents lower than the rated current of the PDS. Therefore, these tests are light load tests. The tests shall be applied to the relevant ports where they exist and shall be performed in a well-defined and reproducible manner on a port-by-port basis. The test method shall comply with 6.2 to 6.4 and clause 7 of CISPR 11, paying particular attention to earth connections.		P
	The load shall be within the manufacturer's specification and the actual load shall be noted in		P

Clause	Requirements EN 61800-3:2004+A1:2012	Result-Remark	Verdict
	the test report.		
6.3.1.2	Conducted emissions		N
	The measurement equipment for evaluation of high-frequency mains terminal (power port) disturbance voltage emission is either the artificial mains network (50 Ω /50 μ H, see CISPR 16-1 and CISPR 11) where it can be applied, or the voltage probe according to CISPR 16-1, where the artificial mains network is not applicable		P
	For <i>in situ</i> measurement of the mains disturbance voltage, a voltage probe without an artificial mains network shall be used (see 6.2.3 of CISPR 11). The same can be applied if the PDS has an input current greater than 100 A, or if the input voltage is greater than or equal to 500 V, or if the PDS contains a line commutated converter (see A.4.1.2).		P
6.3.1.3	Radiated emissions		N
	Equipment of category C1 and category C2 shall be measured on a test site compliant with requirements of CISPR 16-1.		P
	Equipment of category C3 should preferably be tested on a test site compliant with requirements of CISPR 16-1. However, when this proves to be impossible for practical reasons of weight, size or power, tests may be done in a location not fully compliant with the test site requirements. The use of this location shall be justified in the test report. The selection of measurement distances shall comply with the requirements of 5.2.2 and 7.2.3 of CISPR 11 .		P
6.3.2	Connection requirements		N
	If the PDS is measured on a test site, the test set		P

Clause	Requirements EN 61800-3:2004+A1:2012	Result-Remark	Verdict
	up, including length and position of power and control cables, shall be representative of intended application(s), as defined by the manufacturer and described in the user documentation (see 4.3). The test set-up shall be stated in the test report. If the PDS is measured <i>in situ</i> , the cable and the earthing arrangements are those of that application		
6.4	Basic high-frequency emission limits		N
6.4.1	Equipment of categories C1 and C2		N
	6.4.1.1 Power port disturbance voltage Limits for mains terminal disturbance voltage (power ports) are given in Table 14.		P
6.4.1.2	Process measurement and control ports		N
	If a process measurement and control port is intended for connection to a fieldbus, then the port shall comply with the conducted emission requirements of the relevant standard for that fieldbus.		P
	If a process measurement and control port is intended for connection to a public telecommunication network, then this port shall be regarded as a telecommunication port. The conducted emission requirements of CISPR 22, class B apply to that port.		P
6.4.1.3	Radiation – Enclosure port		N
	Limits for electromagnetic radiation disturbance (enclosure port, see definition in 3.3.4 and Figure 2) are given in Table 15.		P
6.4.1.4	Power interface emission		N
	For a PDS to be operated in the first environment, the limitation of emission shall be provided by means of one of the following options.		P

Clause	Requirements EN 61800-3:2004+A1:2012	Result-Remark	Verdict
	a) Measurements on the power interface need not be performed if the length of the corresponding cable is less than 2 m, or if a shielded cable is used. The shielding shall then be of high frequency quality, continuous throughout its length and at least connected to the CDM and motor via 360° terminations.		P
	b) The emission shall be checked by measuring the disturbance voltage at the power interface in the BDM, according to CISPR 14 and applying the limits given in Table 16.		P
	c) Where mitigation methods applied are not suitable for checking according to item b) (for example common mode mitigation methods), the effectiveness of the mitigation method shall be checked by establishing a coupling between the mains input cable and the motor cable during the measurement of the mains terminal disturbance voltage according to 6.4.1.1. This coupling shall be established over the 1 m distance separating the EUT and the AMN by running the motor cable parallel to the mains cable with a separation not exceeding 10 cm over a length of at least 0,60 m		P
6.4.2	Equipment of category C3		N
6.4.2.1	Information requirement		N
	If a PDS does not meet the limits of category C1 or C2, a warning shall be included in the instructions for use stating that:		N
	this type of PDS is not intended to be used on a low-voltage public network which supplies domestic premises; – radio frequency interference is expected if used on such a network		P
	The manufacturer shall provide a guide for installation and use, including recommended		P

Clause	Requirements EN 61800-3:2004+A1:2012	Result-Remark	Verdict
	mitigation devices		
6.4.2.2	Power port disturbance voltage		N
	Limits for mains terminal disturbance voltage (power ports) of PDSs are given in Table 17. The same limits apply to low voltage power ports of PDSs of rated voltage above 1 000 V.		P
	For PDS above 100 A without dedicated transformer, to avoid the risk of crosstalk to signal cables, the installation instructions shall either recommend that the power cables be segregated from signal cables or state alternative mitigation methods		P
6.4.2.3	Process measurement and control ports		N
	If a process measurement and control port is intended for connection to a fieldbus, then the port shall comply with the conducted emission requirements of the relevant standard for that fieldbus.		P
	If a process measurement and control port is intended for connection to a public telecommunication network, then this port shall be regarded as a telecommunication port. The conducted emission requirements of CISPR 22 class A apply to that port.		P
6.4.2.4	Radiation – Enclosure port		N
	Limits for electromagnetic radiation disturbance (enclosure port, see definition in 3.3.4 and Figure 2) of PDSs are given in Table 18.		P
6.4.2.5	Power interface		N
	For a PDS to be operated in the second environment, the instructions for installation and use shall contain all the necessary information on the installation of the power interface as required in 4.3		P

Clause	Requirements EN 61800-3:2004+A1:2012	Result-Remark	Verdict
6.5	Engineering practice		N
6.5.1	PDS of category C4		N
	For PDSs of category C4, the following procedure shall be used.		P
	General conditions. Due to technical reasons, there are some applications where it is not possible for the PDS to comply with the limits of Table 17 and Table 18. These applications are for large ratings or to meet specific technical requirements:		P
	<ul style="list-style-type: none"> – voltage above 1 000 V; – current above 400 A; – networks isolated from earth, or connected to earth through a high impedance (IT system according to 312.2.3 of IEC 60364-1); – where required dynamic performances will be limited as a result of filtering. 		P
	In these applications of category C4 equipment, the user and the manufacturer shall agree on an EMC plan to meet the EMC requirements of the intended application (see annex E). In this situation, the user defines the EMC characteristics of the environment including the whole installation and the neighbourhood (see Figure 5). The manufacturer shall provide information on typical emission levels of the PDS which is to be installed. In the case of interference, the requirements and the procedure in 6.5.2 shall be applied		P
	Filtering in IT-network. The use of filtered PDSs in an isolated, or high impedance earthed industrial distribution network may cause a safety risk, if not properly designed for these applications. In the case of IT networks for		P

Clause	Requirements EN 61800-3:2004+A1:2012	Result-Remark	Verdict
	complex industrial systems, limits cannot be set. The diversity of solutions resulting from the knowledge of the system cannot be standardised. The main considerations are related to fault conditions and filter leakage current		
	<p>a) Short circuit to earth on the motor side of the PDS. This can cause a trip of the IT monitoring system which will lead to an undesired process shut down.</p> <p>b) Short circuit to earth on the motor side can cause the application of common mode voltage to other neighbouring equipment.</p> <p>c) An undesired fail detection by the IT monitoring system because of increased capacitance to earth, which will lead to an undesired process shut down. The solutions are based on a case by case analysis.</p>		P
6.5.2	Limits outside the boundary of an installation, for a PDS of category C4 – Example of propagation of disturbances		P
6.5.2.1	General		N
	For PDSs in the second environment, the user shall ensure that excessive disturbances are not induced into neighbouring low-voltage networks, even if propagation is through a medium voltage network		P
	In the case of complaints about interference occurring at a neighbouring low-voltage network, or in the case of a dispute between the user of a PDS (for example within installation 2 – see Figure 5), and a victim on another network (for example within installation 1), it shall first be clearly established that the disturbance of victim equipment (in installation 1) occurs when the supposed emitting PDS (installation 2) is		P

Clause	Requirements EN 61800-3:2004+A1:2012	Result-Remark	Verdict
	operated.		
6.5.2.2	Interference due to conduction		N
	In this case, the measurements shall be carried out at the low-voltage secondary of the medium-voltage transformer of the installation (installation 1) where the victim is situated (see Figure 5 for point of measurement). The requirements given by Table 19 or Table 20 and Table 21 including the reservations concerning ambient noise, shall be fulfilled.		P
	If the ambient noise (without operation of the PDS which is the supposed emitter) exceeds the limits (Table 19 and Table 20), the supposed emitting PDS is only considered to fail if a characteristic set of emitted frequencies can be recognised and exceeds the measured ambient noise.		P
6.5.2.3	Interference due to radiation		N
6.5.2.3.1	Radiation above 30 MHz		N
	In case of interference, the radiation shall be measured at a distance of 10 m from the boundary of the installation, if interference occurs outside in the first environment, or at a distance of 30 m from the boundary of the installation, if interference occurs outside in the second environment. The measured field strength shall comply with Table 21		P
	If the ambient noise (without operation of the PDS which is the supposed emitter) exceeds the limits (Table 21), the supposed emitting PDS is only considered to fail if a characteristic set of emitted frequencies can be recognised and exceeds the measured ambient noise.		P

Clause	Requirements EN 61800-3:2004+A1:2012	Result-Remark	Verdict
	The emissions from the PDS shall be suppressed until they are below the limits, or below the ambient noise, whichever is the higher.		
6.5.2.3. 2	Radiation between 0,150 MHz and 30 MHz		N
	In case of interference, the radiation shall be measured at a distance of 10 m from the boundary of the installation, if interference occurs in the first environment or at a distance of 30 m from the boundary of the installation, if interference occurs in the second environment. A loop antenna according to CISPR 16-1 shall be used. The values shall not exceed those given in Table 22 at the frequencies for which interference occurs		P
6.6	Application of emission requirements – statistical aspects		N
	The following subclause applies only to PDSs of categories C1, C2 and C3.		P
	For simplicity, conformance tests shall be made on one appliance only. Conformance of the PDSs of categories C1, C2 and C3 shall be verified by performing a type test on a representative model. The manufacturer or supplier shall ensure by means of his quality system that the EMC performance of the product is maintained. In the case of a dispute, a PDS of categories C1, C2 and C3 shall only be considered to fail the requirements of this standard if the production fails the statistical assessment requirements according to Clause 11 of CISPR 11. Therefore, the evaluation shall be made on a well-defined test site		P





=====END=====