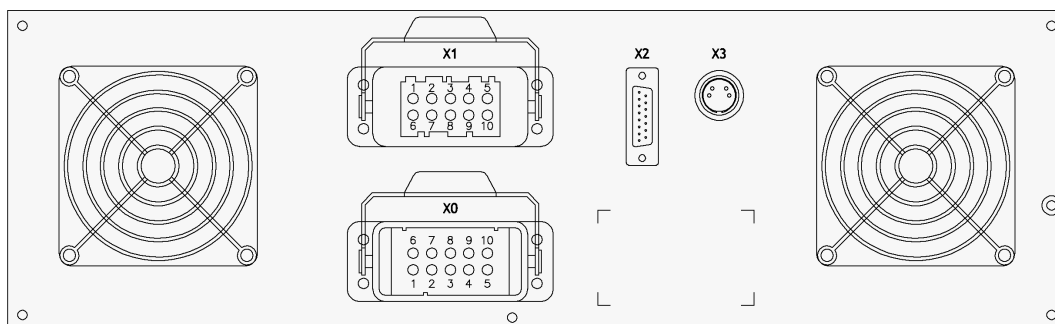
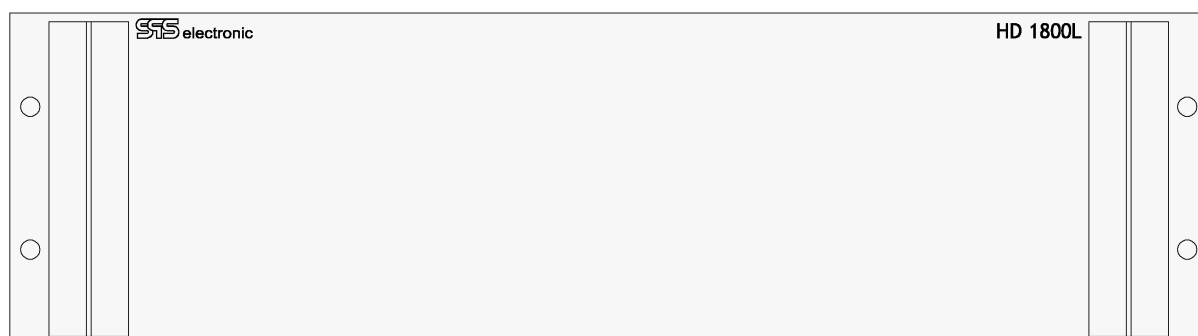


Operating Manual

Rotary-Field Direction Tester HD 1800L

Date: Oct. 2019



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1 General Information

1.1 Information on this operating manual

This operating manual is part of the technical documentation for the rotary-field direction tester HD1800L of SPS electronic GmbH.

This operating manual contains all the information on how to operate this device properly, safely and economically, how to prevent dangerous situations, how to reduce repair costs and downtimes and how to prolong the service life of these devices.

Should you, while perusing this operating manual, find any misprints, any information you do not understand or which are incorrect please do not hesitate to inform SPS electronic GmbH about same.

Pictographs and Symbols

- **Warnings** are characterized by warning triangles with danger symbol and warn of dangers which can lead to personal injury and/or material damage:



General Warning




Danger caused by electric current or voltage

- **Information** on same are characterized by the Information Pictograph and give advice or additional information:



You can order accessories directly from SPS electronic GmbH.

- **Continuations** of contextual paragraphs on the next page are characterized by the symbol  on the right-hand margin.

1.2 Requirements for the operation of this device

1.2.1 Regulations for application

The tester must be in an operational and reliable condition.

Only personnel having completely read and understood this operating manual and who are authorized skilled electricians or who have been instructed in electrical engineering are allowed to perform any operations with and at the testers.

The tester is not to be operated if or for:

- operations are performed which are not specified in this operating manual or which have not been recommended by SPS electronic GmbH concerning installation, operation, maintenance and service.
- unauthorized alterations and/or repairs
- dismantling and/or avoiding of safety devices
- use of components, tools, additional installations, supplements and working material which have not been approved or recommended by SPS electronic GmbH
- building in of spare parts which are not original SPS electronic GmbH spare parts or of spare parts from suppliers not recommended by SPS electronic GmbH

1.2.2 Product liability

The testers have been produced, adjusted and tested according to the state of the art and the approved safety requirements.

The devices comply with the conditions agreed upon by contract of the confirmation of order concerning execution, single parts and accessories selection.

SPS electronic GmbH will be liable for errors or omissions to the extent of the guarantee liabilities of the confirmation of order.

Applicable are the general conditions of delivery of the Central Association of Electrical Engineering and the Electronics Industry, registered association (ZVEI).

The contents of this operating manual is in compliance with the condition of the tester on the date when same was drawn up.

Subject to change are technical alterations because of further developments and improvements of these products by SPS electronic GmbH.

Liability claims can therefore not be derived from the contents of this operating manual (data, descriptions, graphs, misprints, etc.).

Errors and omissions excepted!



**SPS electronic GmbH will only be liable in case of application of the testers according to regulations (pl. see 1.2.1).
If those regulations have not been applied the operator is solely responsible for risks of hazard to body and life of the user or a third party and impairments of the tester and other material assets!**

1.3 General safety regulations

The high voltage tester HA1805 has been manufactured according to the state of the art at the time of its delivery.

Nevertheless the tester is not without hazards if it is applied by untrained personnel, applied improperly or not applied according to regulations.

In addition to this operating manual the generally applicable legal regulations and other binding instructions concerning safety regulations, regulations for preventing accidents and regulations for the protection of the environment must be adhered to.



Beware of high electronic voltage and electromagnetic fields

In case of defective test objects, like e.g. arc-overs, there can occur electromagnetic fields. This is of particular concern to persons with active or passive medical devices, like e.g. cardiac pacemaker.



1.3.1 Obligations of the operator

- The tester is only to be operated according to regulations and in operational condition (see chap. 1.2.1)
- Protective and safety devices, locking devices and couplings, etc. have to be inspected by an expert at least once a year.
- A protocol on the test results has to be drawn up in form of a **test report** same has to be retained.
- Instructions on operations with or at a machine or installation as to hazards to health and/or life of persons are obligatory.
- Persons who operate with or at an HA1805 have to confirm by their signature to have read and comprehended this operating manual especially in regard to the operating instructions.
- Dangerous zones resulting from the integration of the tester into a system or a device have to be located by the operator and safeguarded against.

When assembling or installing devices, systems or items of equipment of different manufacturers or suppliers and after modifications by company or service personnel where changes within the electric equipment were made the operator has, before putting into operation, to perform a precise inspection according to the accident prevention regulations VBG 4 in compliance with the individually applicable rules of electrical engineering.

1.3.2 Operating instructions for personnel

- Operating instructions, general instructions and regulations are part of the tester and have to be accessible, readable and complete for all those who operate with or at the HA1805.
- Before operating with or at the HA1805 questions have to be answered or uncertainties have to be explained by the personnel in charge.
- Any operations with or at the HA1805 may only be performed by workers skilled in electrical engineering or trained in electronic engineering and who have been given instructions for such operations and thus been authorized by the operator.
- Testing personnel may only operate the HA1805 when a skilled electrician is in charge.
- Adjustments, service and inspections have to be performed according to the instructions specified and according to schedule.

1.3.3 Safety installations

The HA1805 testers are, for the safety of the operating personnel, equipped with below safety equipment:

- Protective low voltage (13.1 V) for the 3-phase DUT supply

1.3.4 Information on further publications

For the protection of persons the trade associations and unions have published below literature:

- DIN EN 50191 Installation and Operation of Electrical Installations
- DIN EN 50274 Protection against Electric Shock –
Protection against unintended direct contact of dangerous active parts
- DIN 40 008 part 3 Safety Signs for Electrical Engineering;
Warning Signs and Additional Signs
- DIN 40 050 IP-Protective System, Protection against Contact, Foreign Matter and Water
for Production Equipment
- DIN 57100 Specifications for the Installation of Power Plants with Nominal Voltages of
up to 1000 V
- BGI 891 Establishing and operation of electrical test plants

2 Description

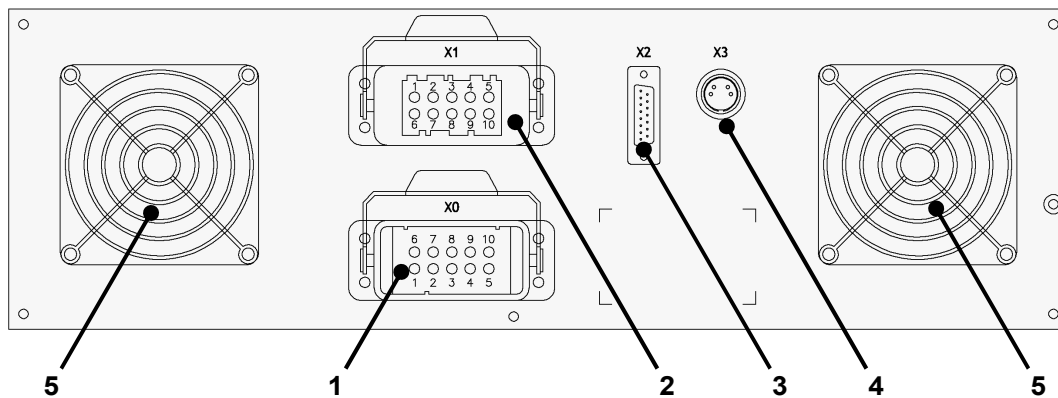
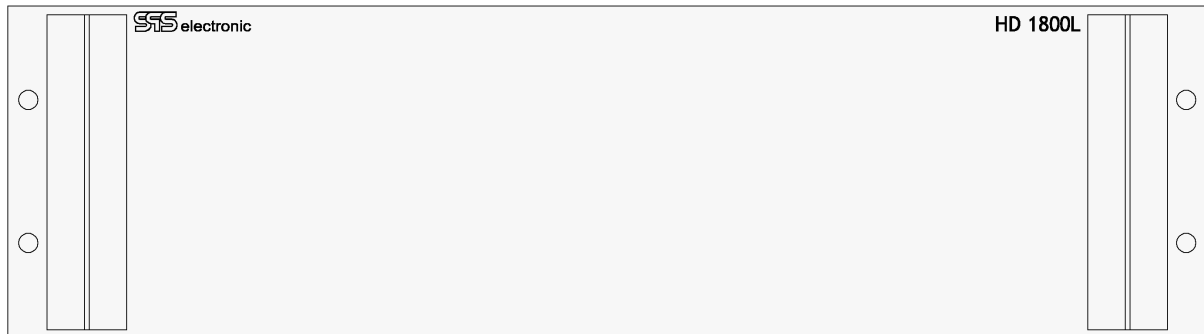
2.1 Device functions

To detect the direction of rotation of a rotating field in a stator (DUT), the rotating field recognition device HD1800L is used. This tester is designed exclusively for use in automated systems, i. e. the device is controlled and the signals are evaluated via external devices. The digital interface X2 enables the control and evaluation of all functions of the device.

By simply inserting the sensor equipped with Hall generators, the coupling to the test object takes place. Three-phase DUTs can be tested in both star and delta connections. In order to achieve stronger magnetic fields, it is advantageous to interconnect the respective test object in delta configuration.

2.3 Set-up of Device

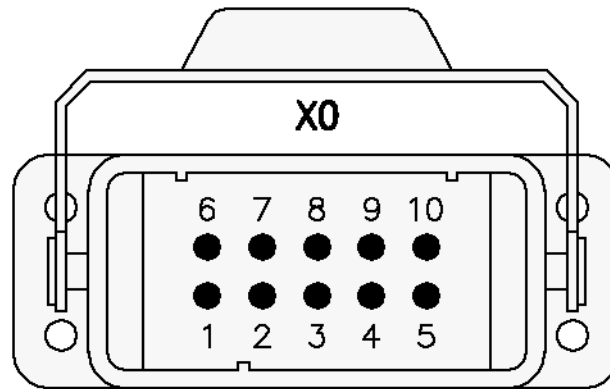
2.3.1 Overview



- 1 10-pole industrial socket, feed-in of mains voltage (X0)
- 2 10-pole industrial socket, output of DUT supply (X1)
- 3 Digital I/O / control interface (X2)
- 4 4-pole phono socket, connection of Hall-sensor probe (X3)
- 5 ventilation grids – keep free of obstruction!

3 Interface Configuration

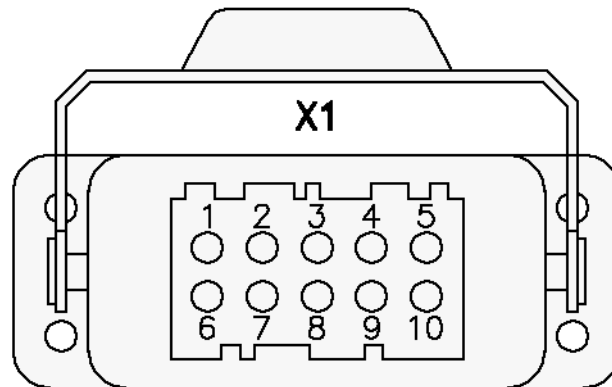
3.1 Mains Interface X0



10-pole industrial plug (male)

PIN	configuration	
1	L1	mains phase 1 (400 V +/- 10%, max. 1.5 A)
2	—	
3	L3	mains phase 3 (400 V +/- 10%, max. 1.5 A)
4	—	
5	PE	protective earth conductor
6	—	
7	L2	mains phase 2 (400 V +/- 10%, max. 1.5 A)
8	—	
9	N	Neutral wire of mains
10	PE	protective earth conductor

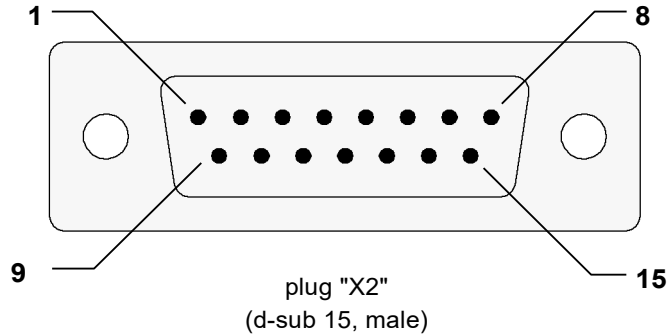
3.2 Output Interface X1



10-pole industrial socket (female)

PIN	configuration	
1 + 6	P1	DUT supply voltage Phase 1 (13.1 V, max. 13 / max. 26 A)
3 + 8	P2	DUT supply voltage Phase 2 (13.1 V, max. 13 / max. 26 A)
5 + 10	P3	DUT supply voltage Phase 3 (13.1 V, max. 13 / max. 26 A)
2	—	
4	—	
7	—	
9	—	

3.3 Digital Control Interface X2

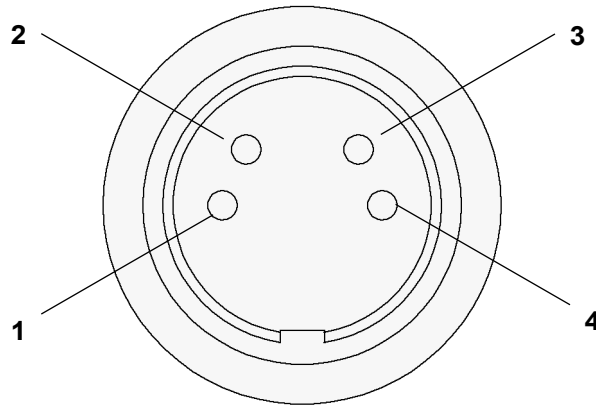


PIN	configuration		
1	ON	Switching ON/OFF of supply voltage output at X1	
2	24 V ext		
3	nL		No left rotation
4	L		Left rotation
5	24 V ext		Signal feed „right“, feed-in 24 V from external
6	nR	No right rotation	
7	R	Right rotation	
8	Rsw	Switching of internal resistance default = 1 Ω (max. 13 A) ↔ 0.5 Ω (max. 26 A)	
9	—		
10	—		
11	—		
12	—		
13	—		
14	+24 V DC	Feed-in of external +24 V supply	
15	GND	Ground potential of ext. 24 V supply	

Signal combinations at PIN 3, 4, 7, 8:

PIN3	PIN4	PIN6	PIN7	
1	0	1	0	Standstill, no rotary field reckognized
0	1	1	0	Rotary field counter-clockwise reckognized
1	0	0	1	Rotary field clockwise reckognized
0	1	0	1	Not possible, measuring error or hardware error
all other combinations				Not possible, measuring error or hardware error

3.4 Sensor Interface X3



Phono socket, 4-pole

PIN	configuration
1	Sensor voltage +
2	Sensor voltage –
3	Input 1
4	Input 2

EU-Konformitätserklärung

EU Declaration of Conformity

Wir / we :

SPS electronic GmbH
The Electrical Safety Test Company
Eugen-Bolz-Straße 8
D-74523 Schwäbisch Hall

erklären hiermit, dass das nachfolgend genannte Gerät den einschlägigen grundlegenden Sicherheitsforderungen der EU-Richtlinien entspricht.

declare, that the following unit complies with all essential safety requirements of the EU Directives.

Geräteart:

Drehrichtungserkennung

Description of device:

Rotary-Field Tester

Typ / Type :

HD 1800L

EU Richtlinien / EU Directives:



EG Maschinenrichtlinie 2006/42/EG mit Änderungen
EC Directive for machinery 2006/42/EC with amendments



EU Niederspannungsrichtlinie 2014/35/EU
EU Directive for low voltage 2014/35/EU



EU Richtlinie Elektromagnetische Verträglichkeit 2014/30/EU mit Änderungen
EU Directive electromagnetic compatibility 2014/30/EU with amendments

Angewandte harmonisierte Normen:

Applicable harmonized standards:

- EN 61 000-3-2; EN 61 000-3-3; EN 55 014-1; EN 55 014-2; EN 50 191

Angewandte nationale Normen und technische Spezifikationen:

Applicable national standards and technical specifications:

30.07.2019

Datum / date:

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ppa. Dipl. Ing. Stefan Ruhl

Dieser Konformitätserklärung unterliegt grundsätzlich nur das von uns gelieferte oder in Betrieb genommene Gerät. Für Änderungen und Erweiterungen ist der Betreiber verantwortlich und damit für die Sicherstellung der Übereinstimmung der veränderten Anlage mit der betreffenden EU-Richtlinie.

Subject to this declaration of conformity is the device as supplied or placed into operation by us.

The operator is responsible for subsequent alterations and extensions, and therefore has to ensure the altered unit complies with the corresponding EU directives.