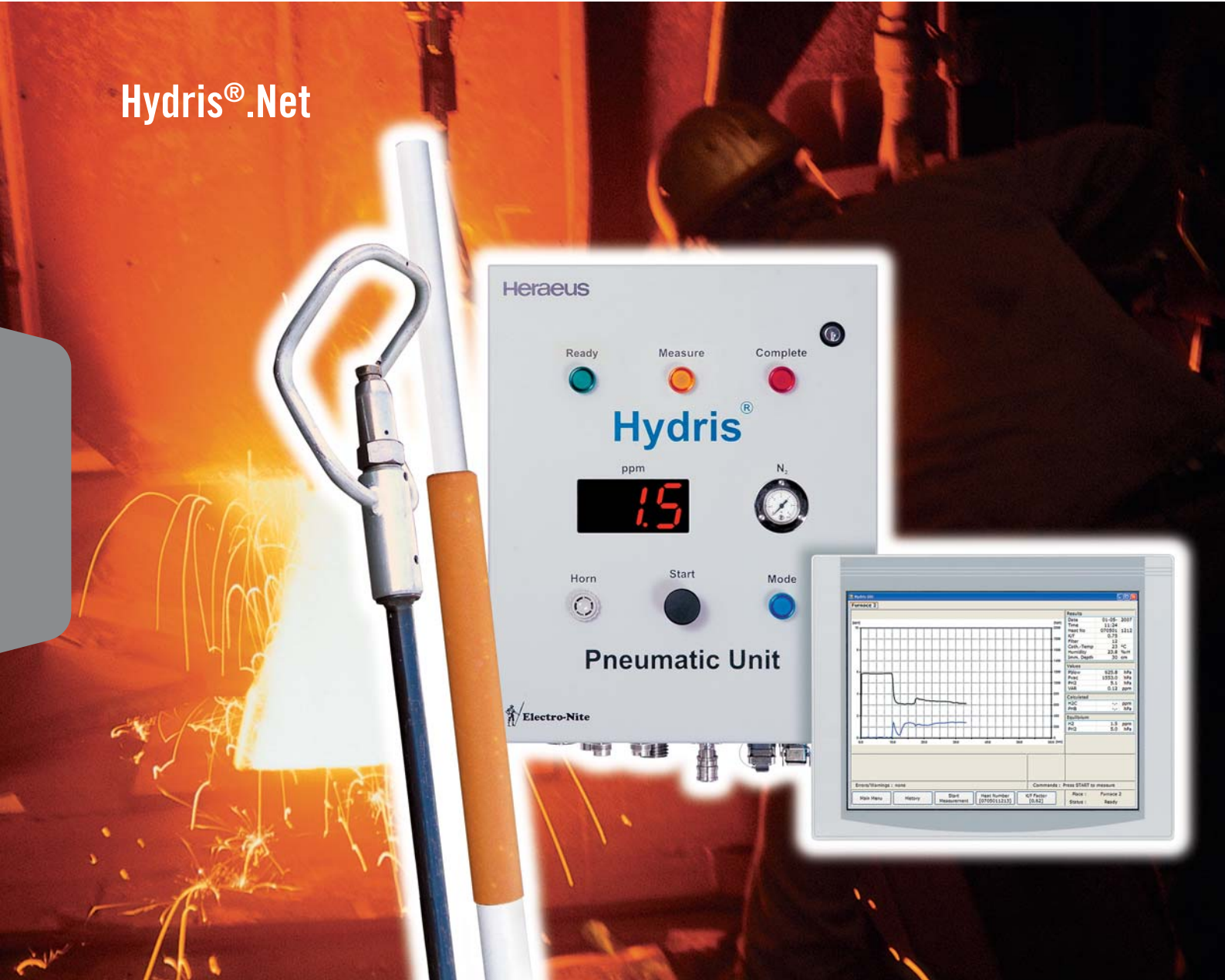


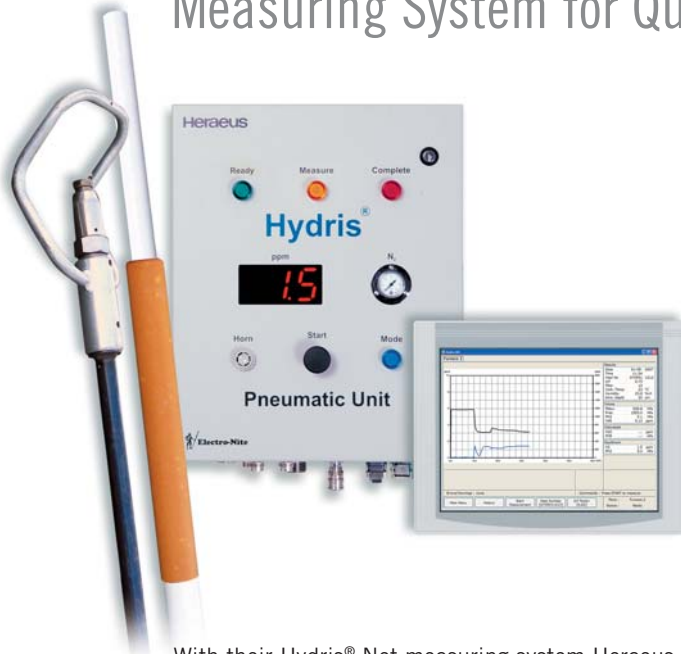
Hydris®.Net



Hydris®.Net
Measuring System
for Quick Determination of Hydrogen

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Measuring System for Quick Determination of Hydrogen



Hydris®.Net measuring system:
Hydris® Pneumatic Lance,
Hydris® Probe,
Hydris® Pneumatic Unit
and Hydris® processor

With their Hydris®.Net measuring system Heraeus Electro-Nite offer a system facilitating direct and rapid determination of hydrogen in molten steels. Its new and improved evaluation principle yields highly accurate measurement results, in particular in the low hydrogen range. They can be ideally used for controlling processes in steel production.

Measuring Principle

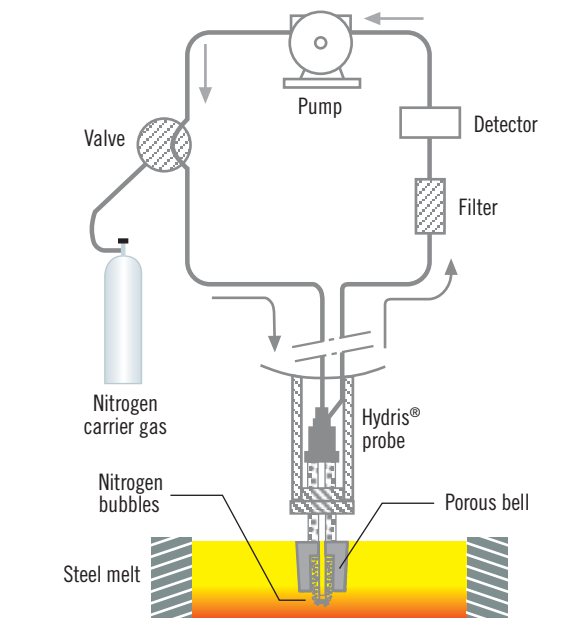
The Hydris® probe is immersed into the steel melt by means of a hand-guided or manipulator-guided immersion lance. A pneumatic cable links the Hydris®

lance with the Hydris® pneumatic unit. The Hydris® pneumatic unit conveys a carrier gas through the Hydris® pneumatic lance and the fit-on Hydris® probe into the steel melt. Here, the gas absorbs the hydrogen contained in the steel melt. To this end, the carrier gas is continuously circulated through the measuring system until an equilibrium is reached between the hydrogen content in the steel melt and the carrier gas. The hydrogen content is continuously measured and displayed as the result when the equilibrium has been reached.

Hydris® Pneumatic Unit

The Hydris® pneumatic unit is installed on site at the place of measurement. Its solid design suitable for steel mill applications ensures reliable operation even under extreme environmental conditions.

Measuring principle Hydris®.Net



- **Solid, dust-protected metal housing**
- **On-site display of measurement result and measurement sequence**
- **Direct digitalisation of measuring data in the pneumatic unit**
- **Rapid adjustment to network configuration by means of memory card**



The front side of the instrument houses three signal lamps for the measurement sequence, a start push button and a display for measurement results. The housing is provided with plug-in connections for immersion lances, moisture filter and carrier gas. Functional units, such as valves, pumps, conductivity detector and the electronic unit, are accommodated and protected inside the Hydris® pneumatic unit. The Hydris® electronic unit converts the measured values into digital signals and sends them to the connected computer for further computation.

A memory card is provided, which is advantageous for the operator of the Hydris®.Net measuring system as it facilitates separate backup of the network configuration data. Thus, the system can be readily adjusted to any new installation site.

Hydris® Processor

The Hydris® processor also designed for the harsh conditions in a steel mill is a 19" built-in unit. Its 15" TFT display is provided with touch screen operating function. The evaluation software is operated in Microsoft Windows®.

- Industrial PC
- Housing front protection type IP 65
- 15" TFT display with touch screen operating function
- Parametering via Microsoft Internet Explorer®
- Database memory for measurement results, evaluation and parametering data

The evaluation and parametering program controls the measurement sequence and calculates the hydrogen content.

Moreover, parametering is possible during network operating via Microsoft Internet Explorer®.

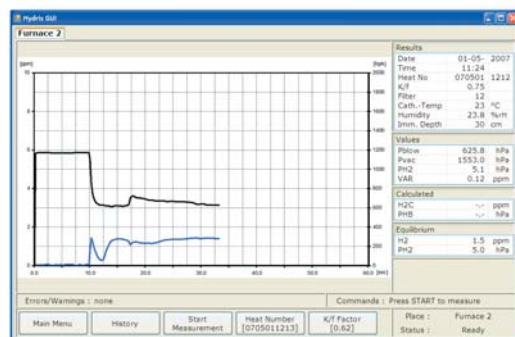
Computer Interfaces

The basic unit comes with user-oriented interfaces. Additional interfaces are optionally available.

Standard interfaces:

- TTY 20 mA/ RS 232
- Ethernet
- USB

Display of measuring results





Optional interfaces:

- Profibus DP
- Modbus RTU
- Data access via OPC

The Hydris® pneumatic unit and the Hydris® processor are linked via Ethernet. Moreover, the Hydris® pneumatic unit is provided with three output contacts for triggering measurement sequence signal lights. If used in a robot-operated system these contacts are used for controlling the immersion lance.

- Ethernet connection between the Hydris® pneumatic unit and the Hydris® processor

- Control outputs for signal alarm devices and PLC

- External start selection

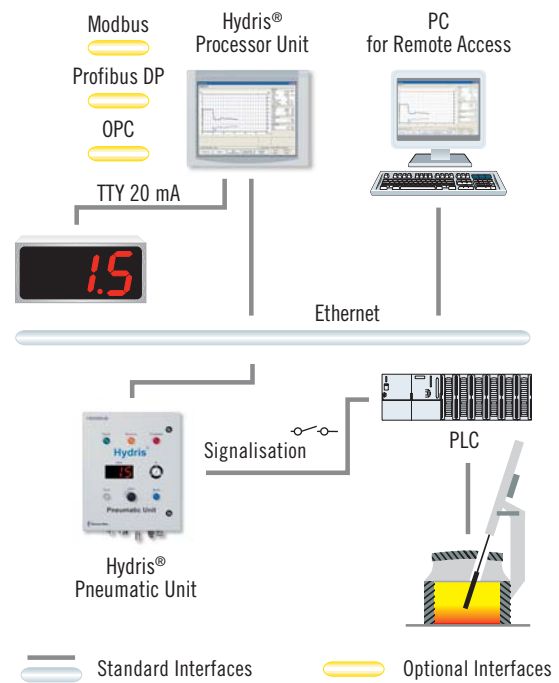
The Measuring System for High-Quality Requirements

In particular, the Hydris®.Net measurement system also covers the low hydrogen application range down to below 1 ppm. The measuring accuracy required in this range is accomplished by the technical features below

High measuring accuracy:

- Pressure compensation
- ΔT compensation of the TCD
- Enhanced zero adjustment
- Automatic immersion depth compensation

Hydris®.Net with standard- und optional interfaces



Limit value comparison Hydris®.Net

Application	Previous levels	Actual levels	Tendency
Rail steel	2 – 5 ppm	1.2 – 3.5 ppm	Low hydrogen content, increasing importance of ladle measurement
Heavy plate, lower sulphur content	2 – 3.5 ppm	1.5 – 3.5 ppm	Low hydrogen content due to lower sulphur content
Forged ingots	1 – 3 ppm	0.5 – 2.5 ppm	Low limiting values



Automatic Immersion Depth Compensation

The automatic immersion depth correction function when immersing the immersion lance further optimises the determination of hydrogen. Alternatively, the immersion depth can, of course, also be set manually.

QuiK-Read Measurement

Apart from the equilibrium measurement principle the Hydris®.Net measuring system is provided with a QuiK-Read function facilitating hydrogen determination within 30 seconds and faster. As early as in the initial phase of measurement the hydrogen content is calculated in advance.

Within the measuring range above 4 ppm hydrogen the QuiK-Read evaluation principle yields measurement results, which are of a comparable quality as those of the equilibrium measuring principle.

Short-time measurement in the medium and high ppm range:

- **Quick measurement result**
- **Reduced thermal load on the immersion lance**
- **Lower load on the pneumatic system**

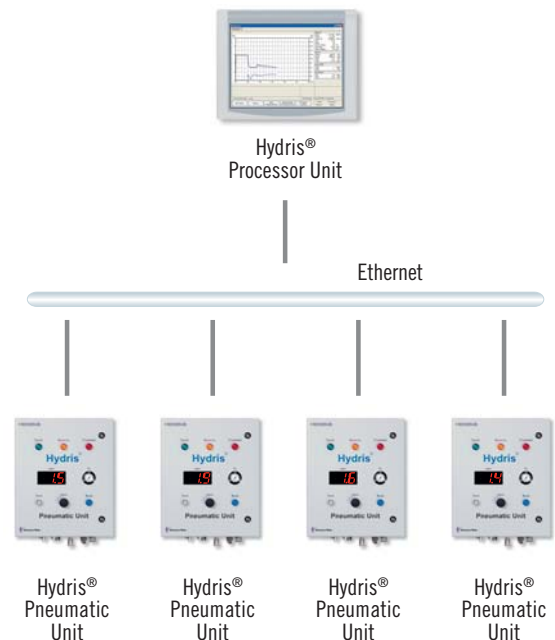
Hydris®.Net Multiple Station Installation

The special performance feature of the Hydris®.Net measuring system is that one Hydris® processor is sufficient for operating up to four measuring stations.

Individual parameter data is stored for the individual measuring stations. This data ensures perfect adjustment to the measuring requirements.

- **Computer networking with up to four Hydris® pneumatic units**
- **Utilisation of the existing Ethernet network**
- **Individual parameterisation of measuring points**

Typical installation Hydris®.Net





Technical Data

Hydris®.Net Measuring System

Hydris® Pneumatic Unit

Built-up, dimensions and weight	metal housing for wallmounting	protection type IP 54	dimensions: H = 535 mm, W = 435 mm, D = 210 mm weight: approx. 31 kg
Connections	plug-in connectors	for immersion lance, carrier gas, moisture filter and power supply	signal outputs, external start function
Connection Hydris® Processor Unit	Ethernet	network: RJ 45	
Operation	start push button "measurement start"	additional external start function	
Measuring process signalling	"ready", "measurement", "complete"	frontal built-in signal lamps and signal buzzer	
Measuring result display	LED display	ppm (H)	digital height 45 mm
Measuring time	45 -120 s		
Measuring range	0.5 up to 14 ppm [% H]		
Standard deviation	0.1 ppm in range 0.5 - 14 ppm		
Signal outputs	"ready", "measurement", "complete"	output via potential free relay contacts	load 2A, 250 V
Operating data	power supply	230 V AC \pm 10%, 50/60 c.p.s	115 V AC \pm 10%, 50/60 c.p.s. as a variant
	power consumption	400 VA	
	ambient temperature	0 °C up to +50 °C	

Hydris® Processor Unit

Built-up, dimensions and weight	19" built-in metal housing, aluminium front panel protection type IP 65	dimensions: H = 357 mm, W = 452 mm, D = 136 mm weight: approx. 16.4 kg	built-in dimensions: H = 334 mm, W = 429 mm, D = 200 mm
Connections	network: RJ 45	power supply: euro plug	
Measuring result display	15" TFT colour display	resolution: 1024 x 768 pixel	numerical/ graphical display
Operation	touchscreen menue controlled	alternatively via keyboard	remote access via Microsoft Internet Explorer®
Measuring result storage	1000 measurements		
Data interfaces	TTY 20 mA/ RS 232	Ethernet, USB	
Operating data	power supply	115/230 V AC, 50/60 c.p.s.	
	power consumption	200 VA	
	ambient temperature	0 °C up to +50 °C	
Optional interfaces	Profibus DP/ Modbus RTU	data access via OPC	
Accessories	Ethernet cable, length 10 m	power supply cable Hydris® Pneumatic Unit, length 1.50 m	power supply cable Hydris® Processor Unit, length 1.50 m

HERAEUS

ELECTRO-NITE GmbH & Co. KG

Im Stift 6 - 8

58119 Hagen (D)

Tel. +49(0)2334.9556

Fax +49(0)2334.955800

info.electro-nite.de@

heraeus.com

www.electro-nite.de

HERAEUS

ELECTRO-NITE INTERNATIONAL N.V.

Centrum Zuid 1105

3530 Houthalen (B)

Tel. +32(0)11.600211

Fax +32(0)11.600400

info.electro-nite.be@

heraeus.com

www.electro-nite.be



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DIN EN ISO 9001:2000
DIN EN ISO 14001