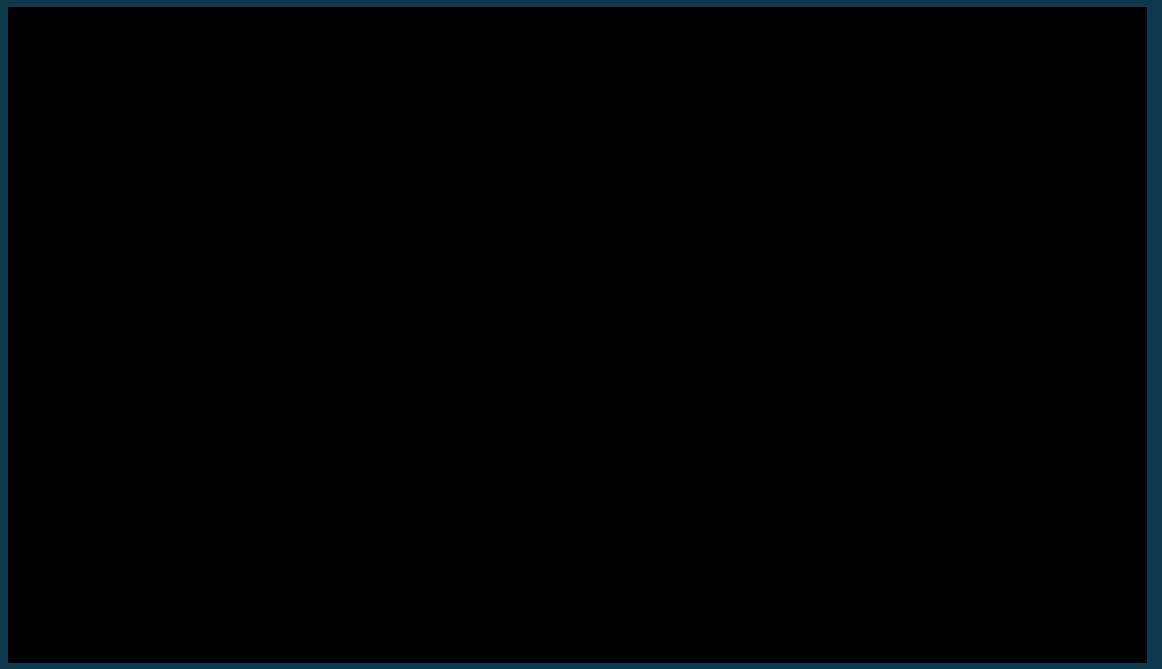


Hirsch Multipuls MPI and Demag

Hirsch's Mobile MPI Machines are:

- Pulsed AC/DC
  - Test large finished parts without fear of arcing
- Multi-directional
  - Detects longitudinal and Transverse flaw at the same time
- Two Magnetizing Circuits
  - Use current flow or Induction in any combination
- Large area of coverage
  - Up to ~18 x 18 ft. (6m x 6m)
- Light weight, as light as 33lbs. (15 kg.) (Multipuls C-1)
- Mobile
  - Fits through a hatch or man-hole (Multipuls C-1)
- High Amperage
  - 8,000 to 30,000 Amps
- Demagnetizing
  - Low frequency DC pulses penetrate deeply into the material for a thorough demagnetization
- Low Power Consumption
  - 8,000 Amp machine runs from 220 V/50/60Hz, 18 Amps
  - Larger machines run from 480 V/50/60 Hz, 32 Amps
- Low operating expense

HPT
Hirsch Prüftechnik GmbH

Hirsch Prueftechnik is a German based manufacturer specializing in the manufacture of Pulsed Multi-direction mobile magnetic particle testing machines. Dr. Peter Hirsch developed his first machine to enable safe testing of seam welds in submarines even in wet condition.

Multipuls machines use capacitor discharge to create a high power, short duration DC pulse of only a few milliseconds.

Testing can be performed with fluorescent or visible, wet or dry particles.

Indications are sharp and clear

Dr.-Ing. Peter Hirsch
Managing Director

Hirsch Multipuls-1003-C1
2-Box model with a DC power peak up to 8,000 A

Designed to fit through the hatch of a submarine and be safely used in wet tanks and structures

Circuits: 2 - Multi-directional
Output : 500 - 8,000 Amp DC
Input: 220 VAC, 18 Amps
Duty Cycle: 50%
Field Strength: 12.5 – 100 Gauss
Frequency: 0.5-2 Hz
Pulses: 1-99
Cables: 4 x 10 ft.
Weight: 2 x 33 lbs.
Size: 10.4W x 12.8H x 14.4D

DC Pulse

- Sharp indications
- No false indications
- No arc strikes
- 100% coverage
- Short inspection time
- Lower weight equipment

Magnetizing Methods

- 2 x current flow
- 1 x current flow, 1 induction
- 2 x induction


SAF

Hirsch Multipuls-1003-E1
DC power peak up to 20,000 A
with handles to be carried by 2 workers

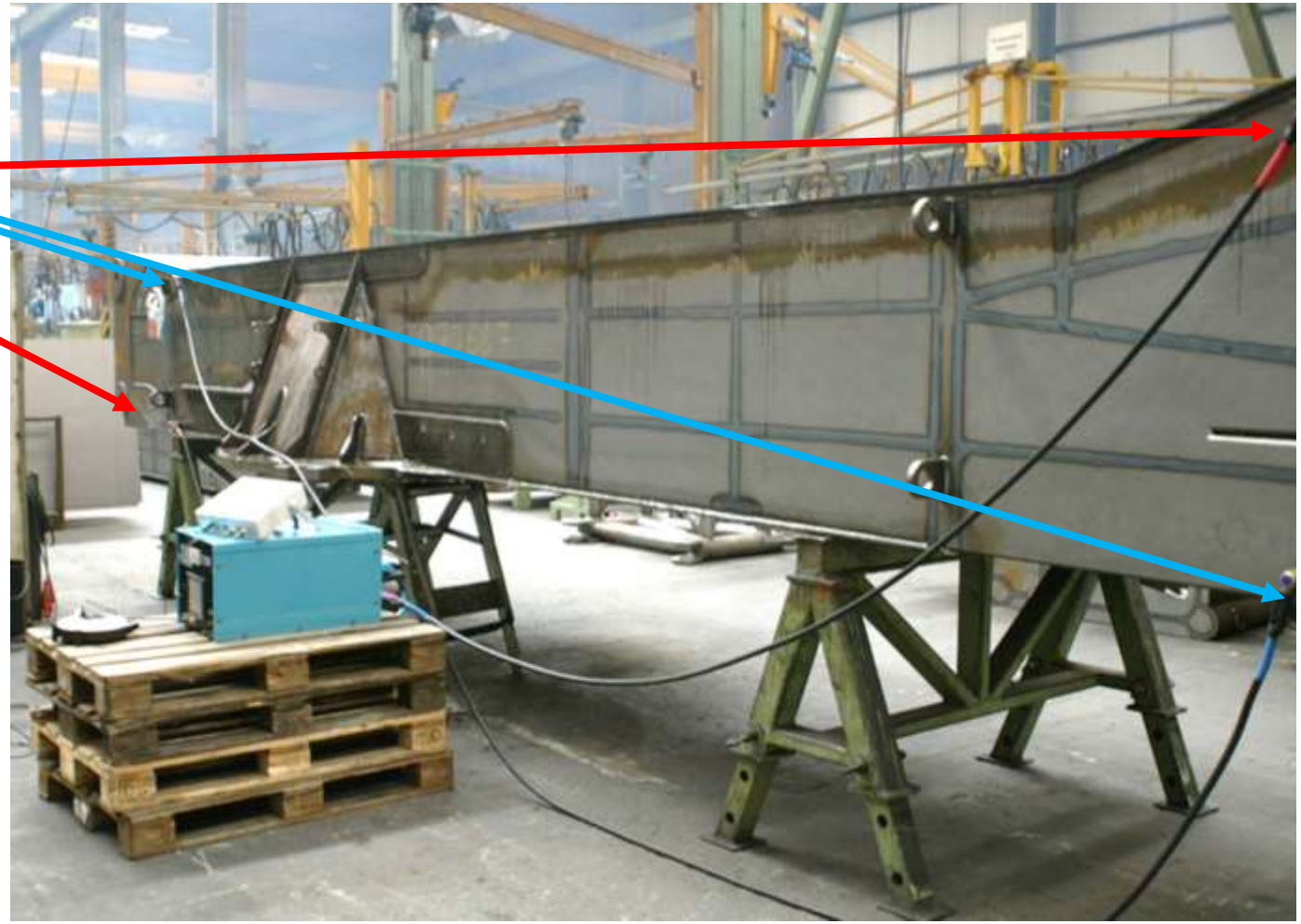
Circuits: 2 - Multi-directional
Output : 500 – 20,000 Amp DC
Input: 440/480 VAC, 32 Amps
Duty Cycle: 50%
Field Strength: 12.5 – 100 Gauss
Frequency: 0.5-2 Hz
Pulses: 1-99
Cables: 4 x 10 ft.
(or customer request)
Weight: 143 lbs.
Size: 17.6”W x 15.2”H x 32”D

Hirsch Multipuls-1003-E2-1
DC Pulse for MPI and Demag with up to 30,000 A

Circuits: 2 - Multi-directional
Output : 500 – 30,000 Amp DC
Input: 440/480 VAC, 32 Amps
Duty Cycle: 70%
Field Strength: 25 – 100 Gauss
Frequency: 0.5-2 Hz
Pulses: 1-99
Cables: 4 x 10 ft. opt. 16.7 ft.
(or customer request)
Weight: 198 lbs.
Size: 15.2”W x 22”H x 32”D

E2-1 testing welds of a 30 ft long beam in one test.

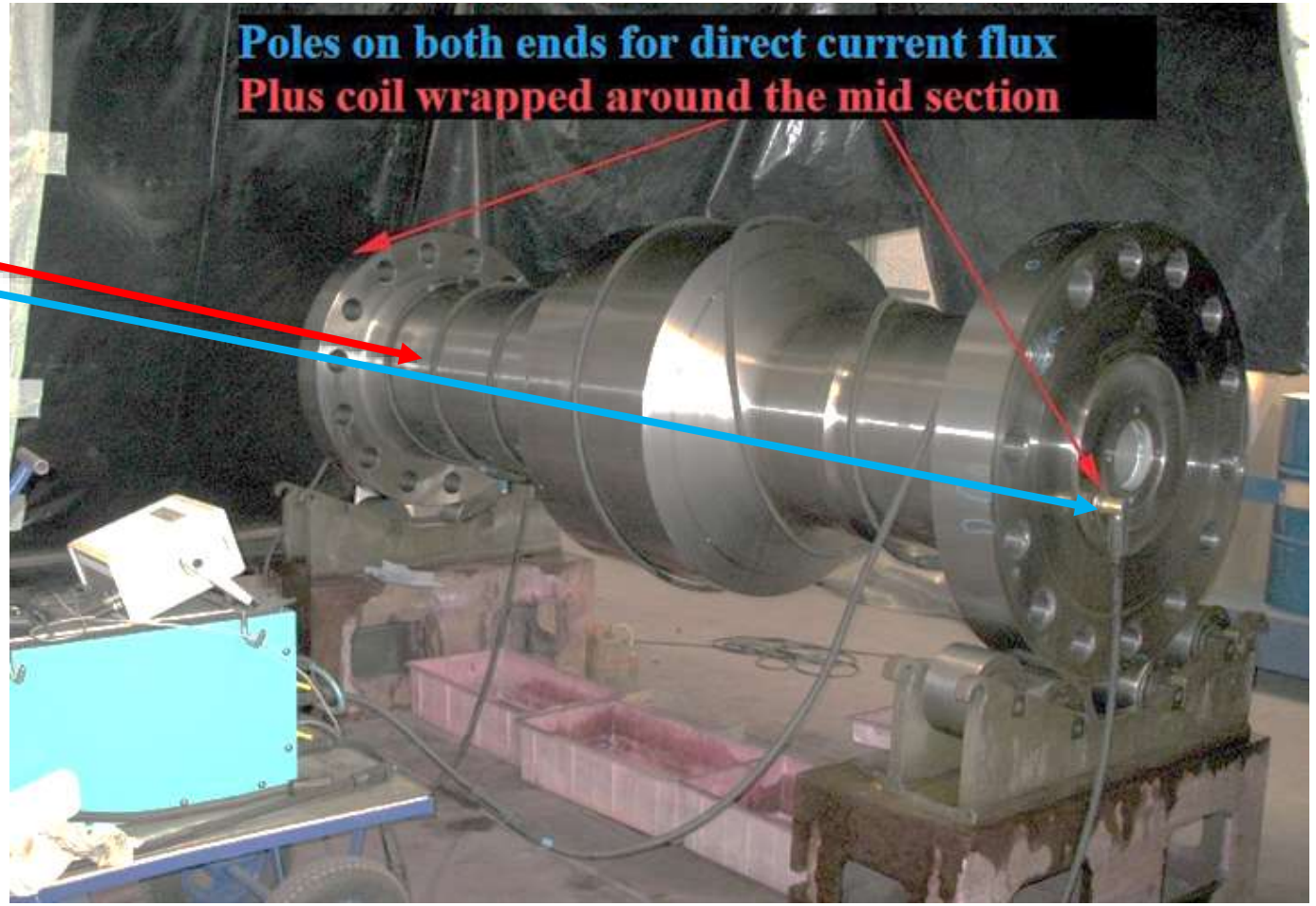
- Connection points
  - A circuit
  - B circuit



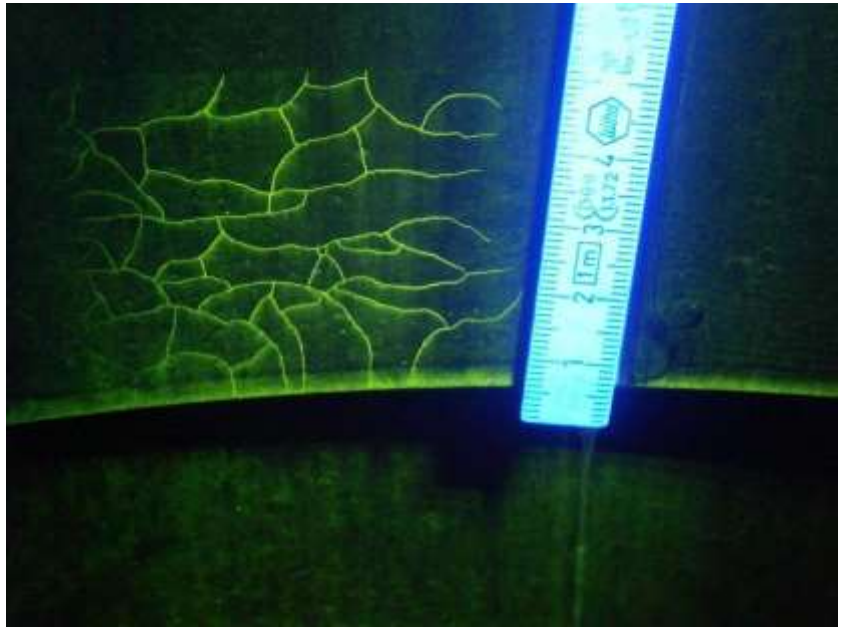
E2-1 testing of a over 13 ft wide by 11 feet high steel blade for a hydroelectric power plant

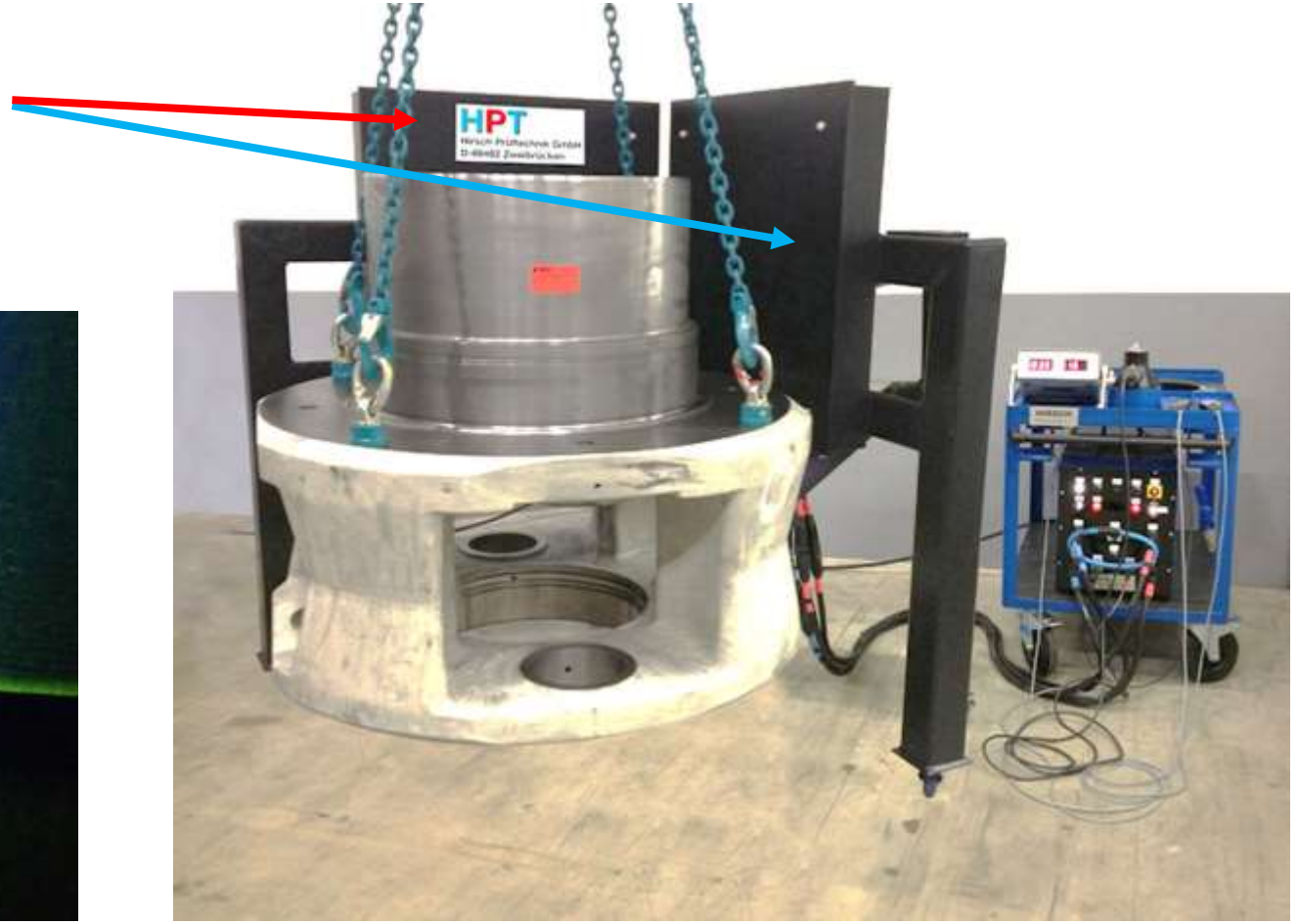
- Connection points
  - A circuit
  - B circuit

Testing 3 Ton Shaft
Using
Cable Wrap
Magnetic Prods



Contact free testing of large forging with Double Coils setup to create longitudinal and transverse magnetism

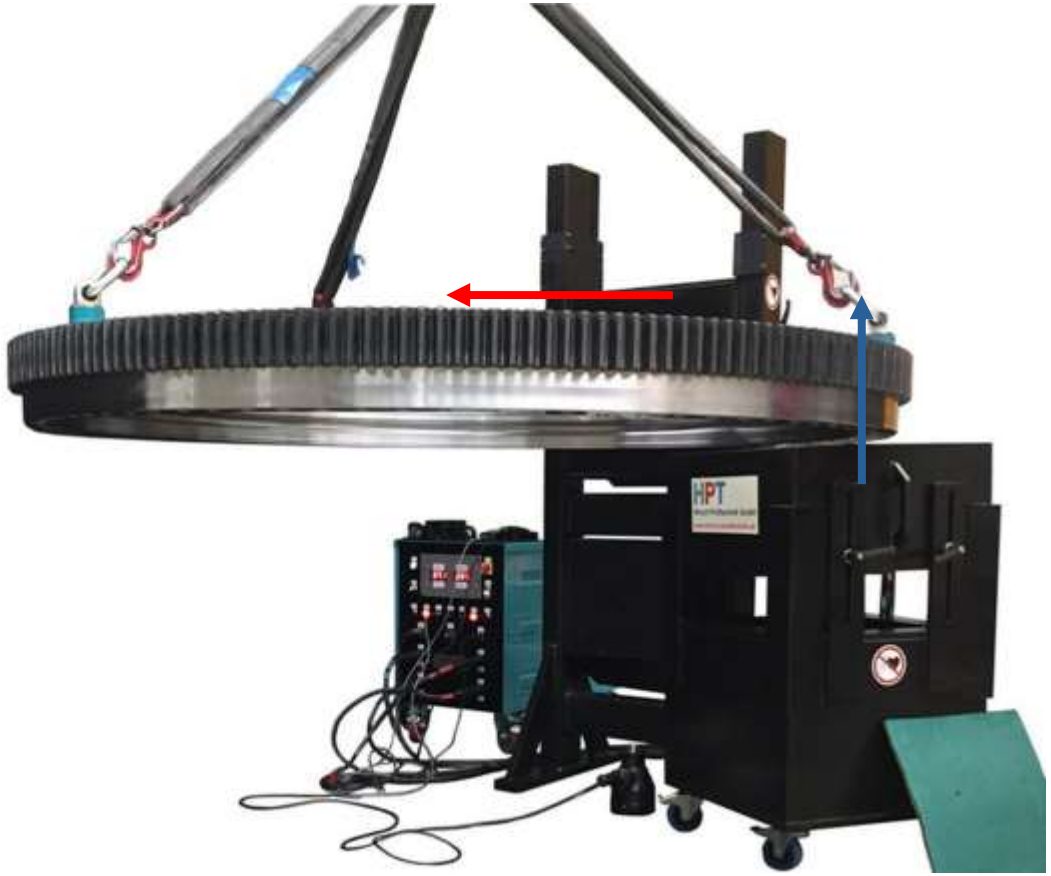




Hirsch Multipuls-1003-E2-2 DC Pulse MPI on wheels up to 30,000 Amps

Circuits: 2 - Multi-directional
Output : 500 – 30,000 Amp DC
Input: 440/480 VAC, 32 Amps
Duty Cycle: 70%
Field Strength: 25 – 100 Gauss
Frequency: 0.5-2 Hz
Pulses: 1-99
Cables: 4 x 10 ft. opt. 16.7 ft. (or customer request)
Weight: 325 lbs.
Size: 20”W x 36”H x 36”D

Double Coil with longitudinal and transverse magnetization



Hirsch Multipuls-1003-E2-3
AC & DC Pulse for MPI and Demag with up to 30,000 A on wheels

Circuits: 2 - Multi-directional
Output : 500 – 30,000 Amp AC/DC
Input: 440/480 VAC, 32 Amps
Duty Cycle: 70%
Field Strength: 25 – 100 Gauss
Frequency: 0.5-2 Hz
Pulses: 1-99
Cables: 4 x 10 ft. opt. 16.7 ft.
(or customer request)
Weight: 352 lbs.
Size: 26.8”W x 25.8”H x 40”D

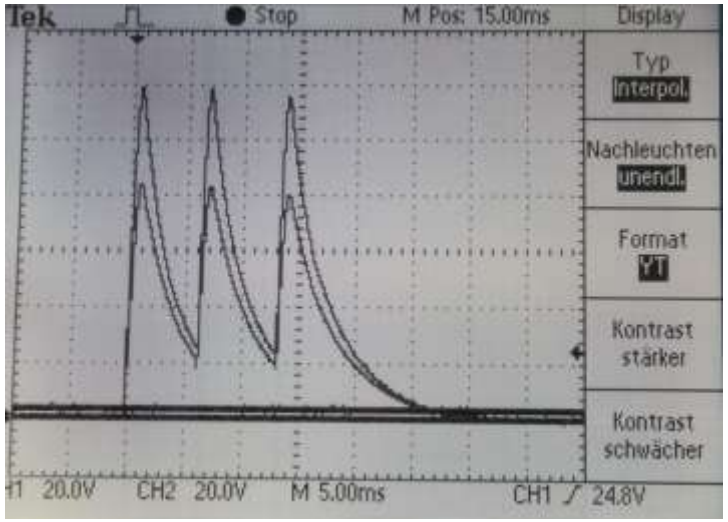
Demagnetization of a gas turbine rotor with a length of over 4 m using the Multipuls-1003-E2-3 device. The rotor had residual field strengths over 250 Gauss and was demagnetized below 4 Gauss

Hirsch Multipuls-1003-E3
Triple power DC Pulse with 3 X 30,000 Amp

Circuits: 2 - Multi-directional
Output : 3x 500 – 30,000 Amp DC
Input: 440/480 VAC, 32/63 Amps
Duty Cycle: 70%
Field Strength: 25 – 100 Gauss
Frequency: 0.5-2 Hz
Pulses: 1-99
Cables: 4 x 10 ft.
(or customer request)
Weight: 1100 lbs.
Size: 26.8”W x 25.8”H x 40”D

The Multipuls-1003-E3 device was a development specifically for MPI work on large components with rough surfaces usually made in foundries. The Multipuls-1003-E3 utilizes a newly developed 3-DC-Pulse technology which greatly improves the quality of crack indications on large components with rough surfaces.

Current and field strength graph of the 3-DC-Pulse technology used by the Multipuls-1003-E3



MPI performed with the Multipuls-E3 device on large components with rough surfaces in the foundry of Allard-Europe nv in Turnhout, Belgium

Magnetic Poles

Connects cables to the machine and part.
High adhesion to the part
No sparks

Measuring Equipment and Accessories:
Pulse Test Currents, Pulse Test Field Strength and Residual Field Strength

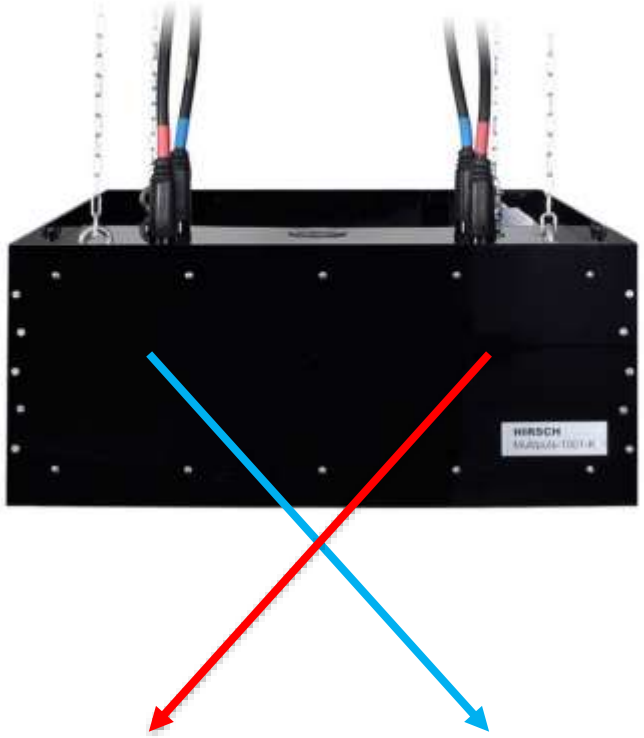
HPT Hirsch Prüftechnik gauge makes relevant measurements for magnetic particle testing and demagnetization. This device is used for inertia-free and non-inductive measurement of pulse test current strength, pulse field strength, and residual field strength.

Measuring device for:

- DC-Pulse current	0-30,000 Amps
- DC-Pulse field strength	0-999 A/cm
- Residual field strength	0-999 A/cm

Testing of welded crane lattice mast constructions

MPI testing of elevator links measuring 12 m in length. During MT testing, they are being moved along underneath a box coil.



Testing of a hydraulic clamp in one step

MPI testing of dual toothed gear wheels. During testing, they are rotated through the coil system.

MPI testing of welded parts on a test table made from two independent cable coils using wood pallets.