

20-LITER SPHERE APPARATUS

FOR DETERMINATION OF EXPLOSION CHARACTERISTICS
OF DUST CLOUDS P_{max} ° $(dp/dt)_{max}$ ° K_{st} ° MEC ° LEL ° LOC

Model: SPD-2.3

ver. 2.3, 2021

THE DEVICE COMPLIES WITH THE STANDARDS LISTED BELOW:

- ASTM E1226 Standard Test Method for Explosibility of Dust Clouds
- ASTM E1515 Standard test method for MEC
- ASTM E2931 Standard test method for Limiting Oxygen Concentration
- EN ISO/IEC 80079-20-2 Explosive atmospheres. Material characteristics. Combustible dust methods.
- EN 14034-1 Determination of the maximum explosion pressure P_{max} of dust clouds
- EN 14034-2 Determination of the maximum rate of explosion pressure rise $(dp/dt)_{max}$ of dust clouds
- EN 14034-3 Determination of the lower explosion limit LEL of dust
- EN 14034-4 Determination of the limiting oxygen concentration LOC of dust clouds

SPECIFICATION:

Double layer sphere vessel	20-liter
Maximum working pressure	30 bar (optional 40 bar)
ANKO software	ANKO Explosion Plotter®
Software functionality	advanced test procedure noise cancelling test report printing
Measurement range:	
P_{max}	0-25 bar
$(dp/dt)_{max}$	> 4000
K_{st}	> 1000
LEL, MEC, UEL	from 0 g/m ³
LOC	1-21 %
Quick dust injection valve	opening time ≤ 30 ms
Front panel vacuum display	0-1 bar abs
Vacuum pressure adjustment	automatic -0.6 & manual
Water cooling system	built-in
Gas temperature measurement	built-in thermocouple result on the front panel
LOC module	optional, built-in
Additional manometers	25 barg, 1 bara
Manual control of injection valve	opening/closing air filling up to 20 bar
Emergency stop	front panel button
Smoke extractor outlet	ø100-150 ° 4"-6"
Space requirements	min. 2,5 x2,5 m
Power supply:	110 or 230 VAC
Manuals:	User Manual, Installation Guide



BUILT-IN UNIQUE DEVICES SUPPLIED WITH THE 20-L APPARATUS:

vacuum pump & vacuum control unit
smoke extractor
top head lift
cooling unit & water level indicator
view glass port
fast DAQ system, rate: 10-100kHz

The information given in this document represents the state of engineering at the time of publishing. We reserve the right to make modifications to above specifications.

DUST DISPERSION & IGNITION SYSTEM



12/24V ignition block

Dispersion nozzles:
 ◦ rebound
 ◦ C-shape (optional)

fast acting valve

quick and safe installation
 of chemical ignitors

opening time ≤ 30 ms

PC or front panel manual control

quick cleaning procedure

BUILT-IN VACUUM BLOCK



- double stage vacuum pump
- air filter
- vacuum sensor and display

BUILT-IN WATER COOLING SYSTEM



- a constant flow of cooling water prevents from uncontrolled temperature rise inside the vessel
- built-in water level indicator

SOFTWARE - ANKO DUST EXPLOSION PLOTTER®

- PC control and data processing
- Visualization of pressure graphs
- Automatic calculation of results
- Noise cancelling
- Safety procedures
- Custom options available
- Upgrades free of charge

Automatic software procedures:

- Pmax, (dp/dt)max, Kst,
- LEL & UEL
- LOC
- Hybrid mixtures
- Partial pressure calculations
- Automatic gas mixing control

Application:

- science and research
- accredited laboratories
- industrial tests
- explosion prevention systems certification

