

Cynoprobe 3



A global leader in mineral and metallurgical innovation



The **MINTEK Cynoprobe 3** is an online Cyanide Analyser specifically developed for the gold mining industry. The instrument makes use of an amperometric measurement technique to allow for rapid online measurements of both free cyanide and WAD cyanide (optional). A potentiometric measurement is also standard to allow validation and/or auto-calibration of the instrument.

Apart from cyanide measurements the instrument provides a pH measurement. An optional ORP measurement is also available. Because of the instruments fast cycle time, it can be setup to measure up to 3 sample points.

For slurry applications the instrument is packaged together with a robust filtration system that minimises maintenance of the instrument.

Instrument packages are also available for heap leaching operations.

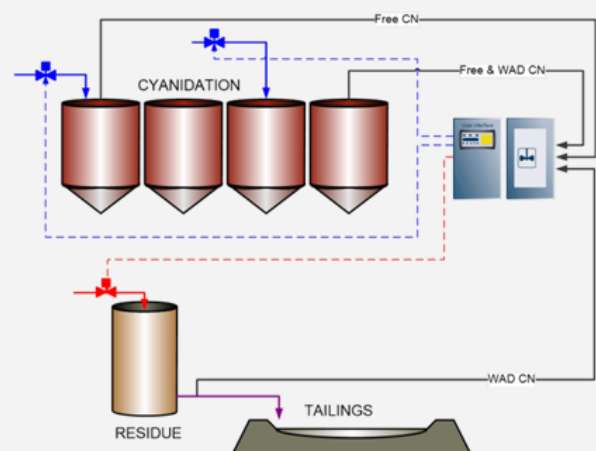
* Measuring ranges on one analyser is: 0.5-10, 3-100, 10-300, 30-1000, 100-3000 ppm cyanide.

Features

- Measurement interval 3 – 5 minutes
- Wide range: 0.5 – 3000ppm*
- Operator-friendly
- Robust construction
- Self-contained
- Easy installation and calibration
- Low reagent consumption

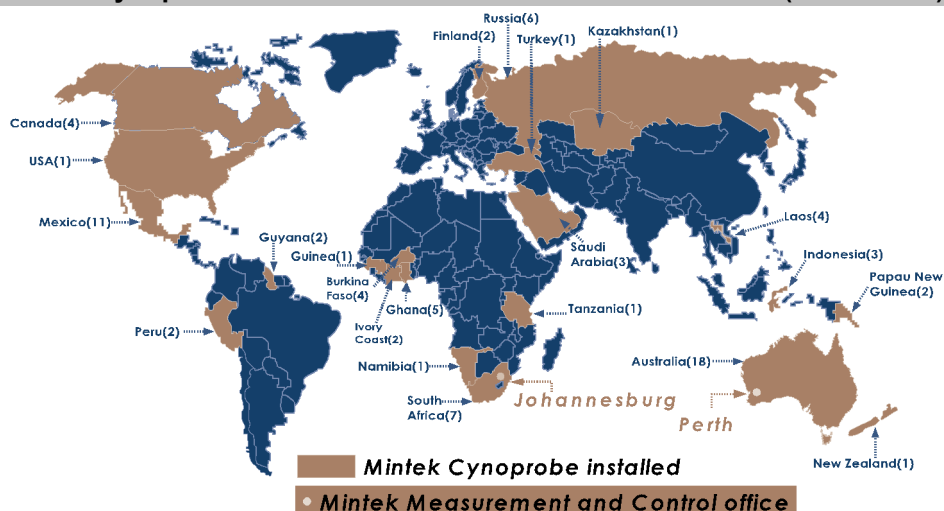
Benefits

- Reduction in cyanide consumption
- Compliance with International Cyanide Code
- Control and optimisation of cyanide destruction processes.
- Low maintenance
- Minimal running costs



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Reference List: The Cynoprobe has a broad international installation base (no. of units)



Comparison between Cynoprobe and other common analysis techniques

	On-line titrator (Free CN)	Picric acid (WAD CN)	Cynoprobe (Free&WAD CN)
Measurement Species	'Titratable' cyanide which is free cyanide and some of the cyanide bound in weak and moderate metal cyanide complexes.	Colorimetric technique measures WAD cyanide.	Amperometry measures the cyanide available to leach gold. It not measures free cyanide but also the cyanide available to leach gold in weak and moderate metal cyanide complexes. Ligand exchange technique with amperometric finish measures WAD cyanide.
Measurement interval	7-10 min	25-30 min	5 min (free CN only) 7 min (free and WAD CN)
Typical number of sample streams	2	1	3
Reagents	Titration consumes AgNO ₃ , careful preparation of AgNO ₃ is required at least once a month	Time consuming preparation of reagents. Picric acid is costly, explosive and requires specialised handling Procurement is difficult due to explosive material legislation.	Free CN: No reagents WAD CN: Ligand exchange reagent is generally easily procured and relatively safe to handle. Cleaning solutions: <ul style="list-style-type: none"> • 3% HCl • 3% H₂O₂
Accuracy	Accuracy is dependant on the assumption that the AgNO ₃ reagent has been accurately prepared to a known concentration . Errors range between 3-6ppm depending on number of AgNO ₃ dosing cycles. Over detection of endpoint due to species equilibrium shift as cyanide is consumed by AgNO ₃ when copper is present.		Close tracking of actual Cyanide concentration, facilitated by direct amperometric response.
Calibration interval	At least monthly. Depending on wearing of dosing pump hose.	At least monthly	Every 3-6 months. Depending on wearing of Ag electrode. Compensation is included in software.

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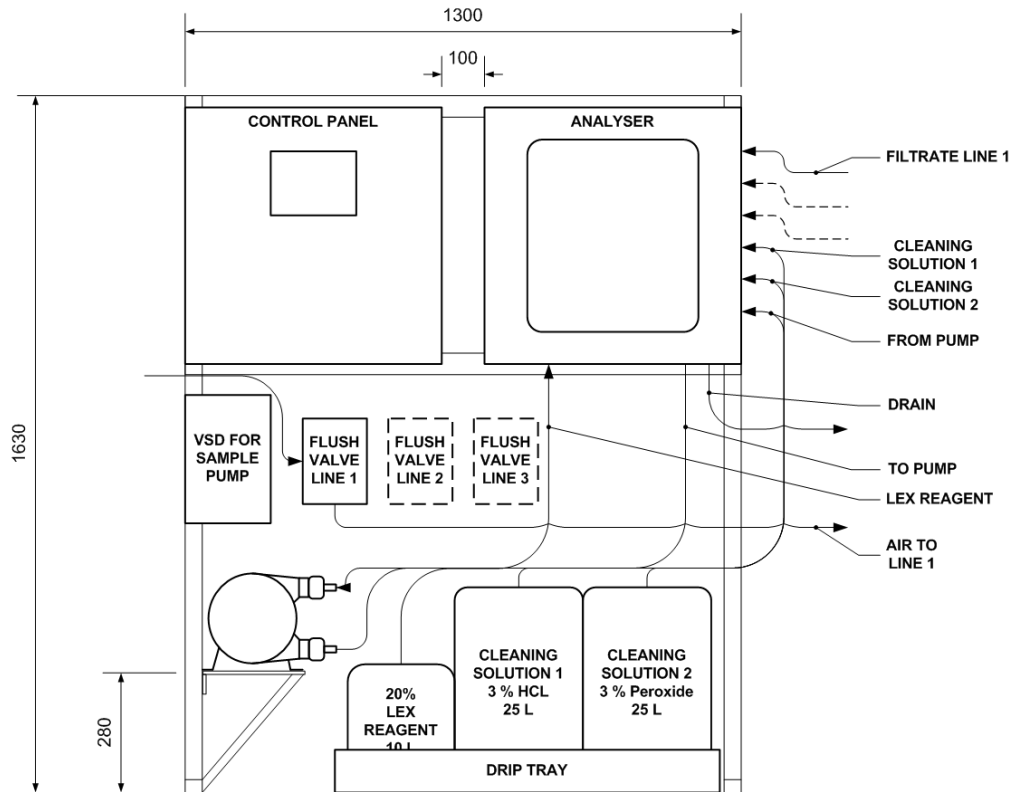
→ Specifications

Process Information	
Duty / Design Life	24 hours per day, 365 days per year except maintenance / 10 years
Sampling Method	Filter cage with polypropylene filter sock
Measuring Method	Amperometric (three electrode system) & Potentiometric Titration
General	
No. of assays per sample point	3 - Cyanide, pH, WAD Cyanide (Optional), ORP (Optional)
Cycle Time	3-5 min per sample point
Sample Measurement Time	60 sec
Measurement and Analysis Method	Amperometry & Potentiometric Titration, with Ligand Exchange for WAD.
Detection Limit	0.5 (For Calibration range 0.5 - 10ppm)
Maximum Concentration	3000 (without dilution)
No. of sample ports	3
Concentration ranges (one analyser)	0.5 – 10, 3 – 100, 10 – 300, 30 – 1000, 100 – 3000
Dilution	3:1 Dilution (Optional). Settable per sample point
Operating Ambient Temperature	5 to 50 C°
Storage temperature	-10 to 50 C°
Instrument Air	Required (4 - 6 kPa)
Power Supply	110 - 240VAC
Power usage (max)	1.3kW
Hardware/Software	Allen Bradley / RSLogix 500 & RS Connected Components Workbench
Calibration	Calibration Wizard. 2 or 3 point calibration
User Interface	Allen Bradley 6" Colour Touch Panel
Maintenance requirements	Monthly calibration and filter sock change.
Local Control Panel and Indication	
Sub supplier / Manufacturer	Rittal
Enclosure Material / IP rating	Powder Coated Zinc Plated / IP 65
PLC model / PLC Communication Protocols	Allen Bradley Micrologix 1100 / Allen Bradley Ethernet
No. of Analog inputs / outputs	one / eight
No. of Digital inputs / outputs	three / two
Locally Mounted Indication	6" Allen Bradley Touch Panel Display
Peristaltic Sample Pump	
Type	Hose Pump
Manufacturer / Model / Frame	Verder Dura 10 / 71
Speed control / Starting method	Adjustable on VSD, Remote ON / OFF via PLC
Demand power (kw) - min / max	0.25 / 0.55
Installed (rated) Motor Power	0.25 kW
Full Load Speed @ 50 hz (rpm)	56 rpm
Rated Voltage	3 phase 400 VAC
Stator Voltage (line to line) / no. of poles	230 VAC / 4
Ingress Protection Rating	IP56
Shipping Information	
No. of pieces shipped	1
Maximum Weight	350 kg
Maximum Size (L x W x H)	1.7 x 0.8 x 1.0 m

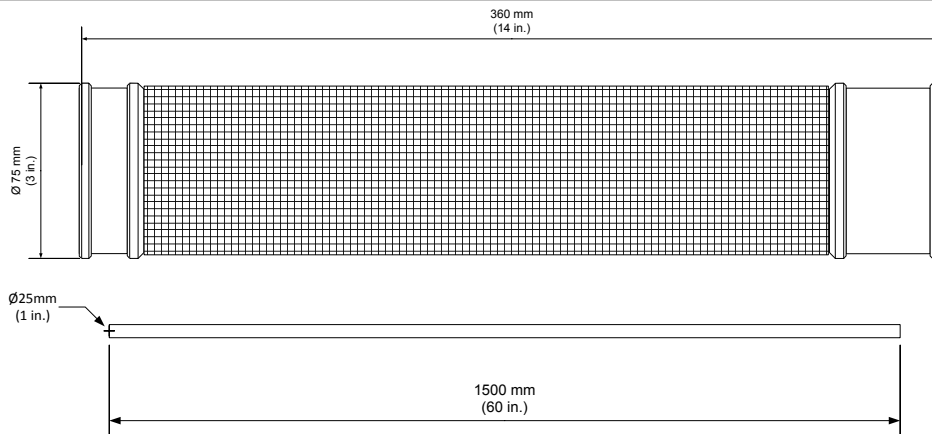
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→ Dimensions

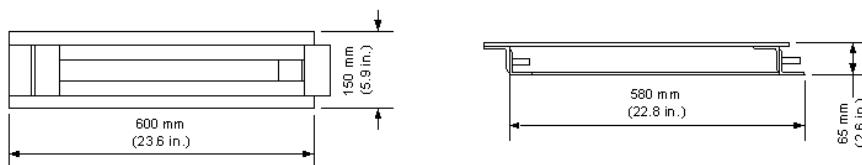
Control Panel & Analyser – General Arrangement



Probe Head and Extension



Probe Bracket



Contact Details

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