ARSELLEF

TurboGuardian

TurboGuardian is a family of products and services designed to save power, enhance compressor reliability and guard against unplanned downtime.

TurboLogix® Controls System Products

TurboLogix® BASIC

- Allen-Bradley CompactLogix hardware standard
- Open software architecture
- Modbus & Allen-Bradley communication included
- 7" 15" color touch-screen operator interface standard
- Extensive data trending/event logs plus backup
- Energy saving compensated turn-down
- Fully field-configurable
- Simplified installation and startup
- DCS-friendly
- Enhanced reliability
- TurboGuardian Cloud compatible





TurboLogix® ENGINEERED

- Includes all of the features of TurboLogix® BASIC
- Customized design panel to fit your needs.
- Allen-Bradley ControlLogix upgrade hardware available
- Replace or integrate with current or obsolete system

TurboLogix^{eV} RETROFITS

- Includes all of the features of TurboLogix[®] BASIC and ENGINEERED
- Designed for quick, easy drop-in retrofit upgrades
- Retrofit solutions available for any OEM
- In-house manufacturing to ensure quick delivery
- Modbus RTU, TCP/IP and Allen-Bradley Ethernet IP communication interfaces standard



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TurboLogix® Controls System Products

Loadsharing POWER SAVINGS

- Energy saving throttle valve alignment and compressor management system to provide utmost in savings from the "inlet guide vane effect" from all units
- "Peer-to-Peer" design no external black box or special hardware required
- Ethernet-based communication network
- Automated management system (start/stop, load/unload) of compressors
- Compatible with electric and turbine driven centrifugal compressors
- Fastest installation and setup anywhere in the world

Rotation Off Rota	equence Rotate		System Pressure 96		ad Sharing	Sequence Inactive Tracking SP: 104	
Local Sequence Timers Low Pressure Start Start and Load Unload Test Delay Unload Test Dwell Unload Delay Stop Delay	N	lachine	Machine Status	IV % S Oper		Motor Amps	Sequencing Activity In
	Lead	2	Modulate Control M	1ode 89	100	145	Progress
	Lag 1	1	Modulate Control M	1ode 71	100	137	Loadshare
	Lag 2	5	Modulate Control N	lode 69	100	133	Loadshare
(mg le coprodui Guerra) Machine ID #1 Machine ID #2 Machine ID #3 Machine ID #4 Machine ID #4 Machine ID #5 Machine ID #5 Machine ID #6 Machine ID	Lag 3	4	Modulate Control M	lode 65	5 100	136	Loadshare
	Lag 4	3	Compressor Star	<mark>iing</mark> 15	0	74	Start Proces
	Lag 5	6	Compressor Rea	dy C	0	0	Loadshare
My Machine ID: 3			Password Not Enter Press Here to Ent		Se	tup	Main

Enhanced PERFORMANCE MONITORING PACKAGE

- Hardware/software enhancement to pinpoint issues that cause frequent downtime
- Features include performance measurements for electricity usage/costs, inlet and bypass valves performance, compressor performance loss due to dirty inlet filters, oil pressure loss due to dirty oil filters and maintenance alerts.
- Highly desirable upgrade for preventative maintenance, enhanced troubleshooting, field performance analysis and cloud-based analytics.
- Helps minimizes field service calls and prevents downtime saving customers money.



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Compressor Road

System

TurboGuardian is a family of products and services designed to save power, enhance compressor reliability and guard against unplanned downtime.

TurboRemote - Remote Cell Access Products

Turbo<mark>Remote</mark>

- Cellular or Permanent Remote Access
- 24/7/365 Availability
- Portable Cell Modem, Wireless or Cloud interconnectivity
- Permanently Wired or Wireless
- Reduce field investigation costs
- Cloud interconnectivity (available in 2020)

TurboRemote Cell^{TLX}

Cellular Based Assistance, Remote Support and Troubleshooting

- Provisional use product that provides factory technical personnel, temporary remote access to compressors to view live operating data for real-time analysis, tuning and troubleshooting.
- Can be supported for short, intermediate or long-term use.
- Features safe and secure remote machine access via a cellular modem that is controlled by the user.
- Kits can be rented, leased or purchased.

Mondes before Nord Available More State of Ref. 2002 Serial: Fords Control Date Events info Setup Trends Function TURBOLOGIX®V

TurboRemote Cloud^{TLX}

Cloud Based Management and Monitoring

- Available for a single compressor or world-wide fleet of compressors.
- A cloud-based IIOT product that provides remote operating status, event information, abnormal event notification, historical data, maintenance reminders, and service/PM reports via the Internet or smart device.
- Features safe, secure VPN technology for remote Cloud hosting of compressor activity, data and maintenance updates.
- Interface hardware is supplied as part of the agreement.
- Available as a subscription service.
- Currently in beta testing (available in 2020)

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TurboGuardian

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TurboAnalytix PROBLEM SOLVING SERVICES

Enhanced Analysis, Products and Solutions

- A suite of enhanced analytics hardware and software with engineering consulting services to help users better manage, maintain and diagnose issues with their compressors, valves, instrumentation and controls.
- Provides the ability to acquire sophisticated analysis, software maintenance and remote compressor testing utilizing cellular or cloud-based data.
- Services are available as stand-alone, "as needed" basis or as an add-on to an on-going PM program.
- Currently in beta testing (available in 2020)

System Pressure Motor 96 105 Compressor Starting Amps Local Unload Selected Throttle Amps SP = 104.0 Pressure SP = 102 Full Load Amps SP = 275 Pressure Temperature Vibration Blowoff Valve Stage 1 $(\mathbf{N}) \rightarrow$ 22 103 0.09 Stage 2 33 268 0.12 Stage 3 65% Closed Inlet Valve 71 ntake $(\mathbf{k}) \leftarrow$ Oil - Brg 25 118 Oil - Filt 32 55% Open Filter Diff 7 Aux Pump Idle 91 H2O - In Stg 1 Cooler CTD 14 Seal Air Okay Running Hours: 22768.0 Stg 2 Cooler CTD 12 Motor Starts Available Before Warning: Minutes Before Next Available Motor Start: 34 Ref 2ACTIM3 Centac Control LoadShare Trends Function

TurboServ REBUILDING PERFORMANCE

Field Service

- A specialized suite of field services dedicated to instrument calibration, installation, tuning, startup and training for centrifugal compressor control systems.
- Services performed by experienced field service technicians utilizing specialized calibration tools and methods to put compressor control systems into optimal operating condition.
- Services can be purchased as a stand-alone service or combined with a standard compressor PM, for a once per year, tune up of a compressor's instrumentation and control system.

