Nexus® Combustion Efficiency Systems

NEXUS®

Burner Control System

An electronic parallel positioning and oxygen trim combustion control system, the NXF4000 model offers integrated burner management.

Fireye provides a variety of flame safeguard and combustion efficiency products. Anywhere you are trying to safely control a flame, you will find a Fireye control.

Our Nexus family of products is used in boiler applications to not only provide the flame safeguard function, but also control the entire burner operation in a manner which greatly improves efficiency and lowers operational costs. Optional variable speed motor control (VFD) and oxygen trim provide power savings and reduced greenhouse gas.

Burner Controls

NXF4000 and PPC4000

Designed for combustion efficiency applications optimized for performance and affordability

NXF4000

Advanced burner management system with parallel positioning and integrated flame safeguard

Features

- Eliminates external flame safeguard
- Increases efficiency
- Reduces fuel consumption
- Reduces emissions and greenhouse gases
- Reduces downtime and maintenance

PPC4000

Air/Fuel Ratio Control

Requires flame safeguard system such as BurnerLogiX® or Flame Monitor®

Features

- Increases efficiency
- Reduces fuel consumption
- Reduces emissions and greenhouse gases
- Reduces downtime and maintenance
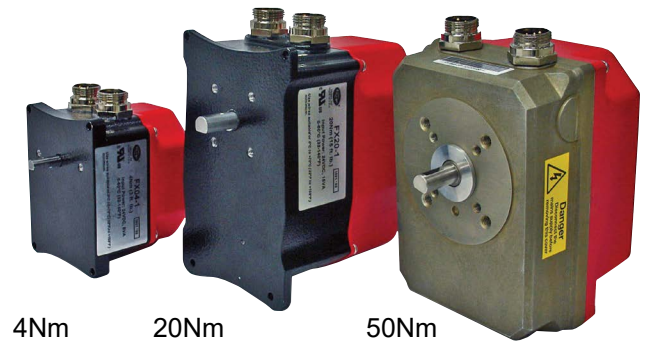
Technical Specifications

	NXF4000 / PPC4000
Supply Voltage	120/230 VAC, 50/60Hz
Power Consumption	Approx. 15 VA (with display attached & no accessories)
Ambient Temperature Range	32° to 140°F (0° to 60°C)
Typical Loads	Display: 6 VA; Oxygen Probe: 12 VA; FX04: 5 VA; FX20: 15 VA; FX50: 20 VA
Branch Circuit	2000 VA
Control Unit Dimensions	5.0" (127mm) wide x 8.0" (203mm) high x 4.0" (102mm) deep
Weight	2.25 lbs (1.02kg)

FX Series Servos
FX04-1 / FX20-1 / FX50-1

Available for use with custom industrial applications

Use a Programmable Logic Controller (PLC) to connect to the FX Series servo using the Modbus RTU protocol via RS-485. Connect up to 10 servos in a point-to-point wiring configuraton on any single communication port.

4Nm   20Nm   50Nm

Features

- Simple procedure for commanding a position and receiving feedback from the servo
- Drive speed selected via PLC; speeds for up to 30 seconds for 90 degree travel are available
- Diagnostic information to help troubleshoot any issues that may arise
- Powered from standard industrial 24VDC power supply
- D-shaft and face tappings allow for easy mounting to couplers and brackets
- Available in three sizes: 4Nm (3 ft.-lb.), 20Nm (15 ft.-lb.) and 50Nm (37 ft.-lb.)

Technical Specifications

SERVO TYPE	FX04-1 (4Nm)	FX20-1 (20Nm)	FX50-1 (50Nm)
Supply Voltage	24VDC +/-10%	24VDC +/-10%	24VDC +/-10%
Normal Torque	3 lbs-ft / 4Nm	15 lbs-ft / 20Nm	37 lbs-ft / 50Nm
Holding Torque	<3 lbs-ft / 4Nm	8 lbs-ft / 10Nm	19 lbs-ft / 20Nm
Power Consumption	5 VA Nominal	15 VA Nominal	20 VA Nominal
Working Temperature Range	-4° to 140°F (-20° to 60°C) 100% duty cycle	-4° to 140°F (-20° to 60°C) 100% duty cycle	-4° to 140°F (-20° to 60°C) 100% duty cycle
Protection Category	NEMA 4 / IP65	NEMA 4 / IP65	NEMA 4 / IP65
Maximum Angle Rotation	100°	100°	100°
Rotation Limits	Software	Software	Software
Feedback Potentiometer	Single turn conductive plastic, 1KΩ +/- 1% linearity	Single turn conductive plastic, 1KΩ +/- 1% linearity	Single turn conductive plastic, 1KΩ +/- 1% linearity
Nominal Dimensions	4.59" (116.8mm) high x 3.27" (83.1mm) wide x 4.91" (124.7mm) deep	6.51" (165.4mm) high x 4.08" (103.5mm) wide x 7.24" (183.7mm) deep	5.36" (136mm) high x 4.76" (121mm) wide x 7.31" (185.8mm) deep
Weight	2.27 lbs (1.03kg)	5.43 lbs (2.46kg)	6.10 lbs (2.77kg)
Installation Position	Any	Any	Any

Color Touchscreens
NXTSD507HD / NXTSD512HD

Set up, control and monitor Nexus systems with full-color touchscreens

The color touchscreen user interfaces provide the means to set up, monitor and display all information from the burner control (NXF4000 or PPC4000) and connected accessories. The touchscreens provide all of the functions required to control and monitor the burner. In addition to status monitoring, it can be used to setup and commission the control.

The NXTSD507HD is a 7" widescreen TFT color touchscreen that is panel mounted and connects directly to a Fireye burner control (NXF4000 or PPC4000) using a Fireye cable kit (129-196). This touchscreen model is designed to monitor only one boiler control.

The NXTSD512HD is a 12" widescreen TFT color touchscreen display. This display is designed to monitor multiple burner controls (up to six), is panel mounted and connects directly to Fireye burner controls (NXF4000 or PPC4000) using a Fireye cable kit (129-196). When multiple burner controls are available, information on each unit can be selected by using the 'Burner Select' drop down field.

Features

- Enhanced graphical interface
- Flexible location control (local or remote setup)
- Fully configurable display
- Indoor use only, IP40
- Two different sizes for compatibility with most installations

Touchscreen Interface
NXD410TS

The touchscreen interface provides the means to setup, monitor and display information from Fireye burner controls (NXF4000 or PPC4000) as well as any connected accessories. It provides a full touchscreen interface for monitoring, configuration and commissioning. The touchscreen is panel mounted and connects to the control using a serial communication cable.

Features

- Projective capacitive screen
- 480 x 272 resolution
- 109.2mm (4.3") screen area
- Indoor use only, IP40

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Oxygen Probe (NXCESO2 / FXCESO2)

The oxygen probe is designed to be used with the Fireye burner controls (NXF4000 or PPC 4000) and provides continuous oxygen concentration readings. This allows the burner controller to trim the air or fuel servo to obtain optimum combustion efficiency.

Features

- Provides continuous oxygen readings
- Allows control to trim air or fuel servo
- Provides stack temperature
- Field replaceable oxygen sensor cartridge
- Data available via Modbus-RTU
- Available in 8.5", 16" and 30" insertion depth
- Available mounting flange and cover

35-381-2
Mounting Flange

129-189
Flange Cover

Ambient Air Temperature Sensor (FXIATS-140)

The ambient air temperature sensor offers a fast, stable, repeatable, and accurate means of measuring ambient air temperature in harsh environments.

Features

- For use with burner/boiler efficiency calculations
- -40° to 140°F (40° to 60°C)

Plant Master (PMSTR-4000)

The plant master provides central control of steam or hot water systems for up to eight Fireye burner controls (NXF4000 or PPC4000). The connection to each control uses standard Modbus wiring to a dedicated sequencing bus.

Features

- Modbus RTU via RS-485
- IP65 (NEMA 4X), indoor use only (not UV stabilized)
- TFT 177.8mm (7") screen with 800 x 480 resolution

Temperature Sensors (TS350-x / TS752-x)

The temperature sensors are designed for use with the fuel air ratio controller (PPC4000). The temperature sensors utilize a platinum, positive temperature coefficient sensing element to provide indication of water temperature, stack temperature, boiler water temperature of a steam boiler, and outdoor air temperature.

Features

- 4-20mA output, linear with temperature
- Insertion length varies from 2" to 8"
- Stainless steel thermowell included with 1/2" - 1/4" NPT mounting

ITEM	TEMPERATURE RANGE	LENGTH
TS350-2	32° to 350°F (0° to 176°C)	2"
TS350-4	32° to 350°F (0° to 176°C)	4"
TS350-8	32° to 350°F (0° to 176°C)	8"
TS752-2	32° to 752°F (0° to 400°C)	2"
TS752-4	32° to 752°F (0° to 400°C)	4"
TS752-8	32° to 752°F (0° to 400°C)	8"

Pressure Sensors (BLPS-x)

The pressure sensors are designed for use with the fuel air ratio controller (PPC4000). The pressure sensors utilize a solid state pressure transducer to indicate steam pressure.

Features

- Pressure transducer
- 4-20mA output, linear with pressure
- 1/4" NPT mounting
- Screw terminal connections and conduit adapter cover

ITEM	TEMPERATURE RANGE
BLPS-15	0 to 15 psi (0 to 1030 mb)
BLPS-25	-14.7 to 25 psi (-1013 to 1720 mb)
BLPS-30	0 to 30 psi (0 to 2070 mb)
BLPS-200	0 to 200 psi (0 to 13.8 bar)
BLPS-300	0 to 300 psi (0 to 20.7 bar)

Flame Scanners

UV1AL-3	UV90L-1	48PT2	85UVF/IRF	95DSS3
UV 1/2" NPT straight flame scanner, non-continuous operation	90° UV flame scanner, non-continuous operation	Infrared 1/2" NPT straight or 90° flame scanner, continuous or non-continuous operation	Phoenix integrated flame scanner utilizing a solid state flame sensor	InSight® II integrated flame scanner with UV and IR sensors

ITEM	DESCRIPTION
CONTROL	
NXF4000	Integrated burner management controller with parallel positioning, 120 VAC input; requires plug-in FSG daughtercard
NXF4000-230V	Integrated burner management controller with parallel positioning, 230 VAC input; requires plug-in FSG daughtercard
PPC4000	Parallel positioning system, 120 VAC input; used with external flame safeguard control
PPC-4000-230V	Parallel positioning system, 230 VAC input; used with external flame safeguard control
DISPLAY	
NXD410TS	User interface with touchscreen, 24 VDC operation, backlit LCD display, panel mount only, includes mounting brackets
59-562-2	Cable assembly, 10 feet length; for interfacing NXD410 to control
NXTSD507HD	7-inch (diagonal) color touchscreen display
NXTSD512HD	13-inch (diagonal) color touchscreen display
129-126-2	Replacement cable kit (power and comms) for NXTSDxxx touchscreens
SERVOS	
FX04, -1	Servo motor, 24 VDC operation, 4Nm, 3 lb.-ft. torque, without connectors, accepts 1/2-inch NPT fitting, minimum travel time of 30 seconds for 90° (-1 with quick disconnect connectors)
FX20, -1	Servo motor, 24 VDC operation, 20Nm, 15 lb.-ft. torque, without connectors, accepts 1/2-inch NPT fitting, minimum travel time of 30 seconds for 90° (-1 with quick disconnect connectors)
FX50, -1	5 wire Modbus Servo-motor, 37 ft. lbs., 50Nm, 24 VDC, with terminal block wiring connections (-1 with quick disconnect connectors)
SERVO CABLES/ACCESSORIES	
59-595-6	Cord set, 6 feet, 1/2-inch NPT connectors on both ends, PVC jacket, temperature rating -40° to 105°C, meets NEMA 1,3,4,6P and IEC67
59-565-40	Cord set, 40 feet, 1/2-inch NPT connectors on both ends, PVC jacket, temperature rating -40° to 105°C, meets NEMA 1,3,4,6P and IEC67
CONNECTOR KIT	
129-192	Connector, field wirable; used for FX04-1, FX20-1, FX50-1 servos with connectors; use cable 59-561
129-194	Servo (male) connector kit for FX04, FX20, FX50
59-565	Cable, 1 twisted pair, 2 power wires, suitable for servo hookup
O2 PROBE	
NXCESO2-8, -16, -30	Oxygen probe assembly, 8" (215mm) insertion, 16" (406mm) insertion, 30" (757mm) insertion; (kit versions available)
NXCESO2P42	Cartridge, probe replacement
FXCESO2-8, -16, -30	High temperature oxygen probe assembly, 8" (215mm) insertion, 16" (406mm) insertion, 30" (757mm) insertion; requires FXO2TRIM-1 interface module
FXO2TRIM-1	Oxygen probe interface module for FXCESO2 probes
35-381-2	Flange, oxygen probe mounting
129-189	Cover, mounting flange
129-190	Fan replacement kit for NXCESO2 probe

ITEM	DESCRIPTION
PRESSURE TRANSDUCERS	
BLPS-15, -25, -30	Pressure transducer, 0 to 15 psi (0 to 1030 mb), -14.7 to 25 psi (-1013 to 1720 mb), 0 to 30 psi (0 to 2070 mb), 4-20mA output linear with pressure, 1/4-inch NPTF mounting, screw terminal connections and conduit adapter cover
BLPS-200, 300	Pressure transducer, 0 to 200 psi (0 to 13.8 Bar), 0 to 300 psi (0 to 20.7 Bar), 4-20mA output linear with pressure, 1/4-inch NPTF mounting, screw terminal connections and conduit adapter cover
TEMPERATURE TRANSDUCERS	
TS350-2, -4, -8	Temperature sensor, range 32° to 350°F (0° to 176°C), 4-20mA output, linear with temperature, insertion length is 2, 4, 8 inches; stainless steel thermowell included
TS752-2, -4, -8	Temperature sensor, range 32° to 752°F (0° to 400°C), 4-20mA output, linear with temperature, insertion length is 2, 4, 8 inches; stainless steel thermowell included
FXIATS-140	Ambient temperature transmitter, -40° to 140°F (-40° to 60°C), 4-20mA output, 7 to 40VDC, NEMA enclosure
PLANT MASTER	
PMSTR-4000	Plant master for use with NXF4000 and PPC4000 efficiency controls
PLUG-IN DAUGHTERCARDS	
NXCESVFD	VFD plug-in card for PPC4000 / NXF4000
NXCESUV	UV plug-in card for NXF4000
NXCESIR	IR plug-in card for NXF4000
NXCESDC	Direct-couple plug-in for NXF4000
BRACKETS/COUPLINGS	
Contact factory or your local distributor	

Fireye is a leading manufacturer of flame safeguard controls and burner management systems for commercial and industrial applications throughout the world. Our products can be found in a variety of public buildings, commercial properties, power plants, pulp and paper mills, petrochemical facilities and food processing plants. Fireye is a part of Carrier, the leading global provider of healthy, safe, sustainable and intelligent building and cold chain solutions.

For more information, please visit fireye.com.

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