Contact SW/LES Date 12/20/2012 10-25-12org.1.14.13.Elev.2.23.12.Filters.Regs.Sub

"Re-Submittal -2" Burner Specification Sheet

Job Number J071639-0 **Qty** 1 **Order Number** B050902 **Line Number** 1
Customer ENERGY CONSORTIUM IND INC **Purchase Order** P5905
Job Name VA SHERIDAN

Burner Model	LNICM11-G-30				
Burner Mode of Operation	MOD ODP	**Serial Number**			
Code	NFPA				
UL Label					
Heat Exchanger Make	SUPERIOR	**Heat Exchanger Model**	SUPER		
Heat Exchanger Type	Scotch				
Combustion Chamber Pressure	3.7				
Job Site Altitude	3743 FT	**Clearance Checked By**			
Clipped Circuit Board PN					
Gas High Fire Rate	29,400 MBH				
Oil High Fire Rate	GPH	**PSIG Pump**			
Fuel Oil Grade					
UL Group - Gas		**UL Group - Oil**			
Gas Type	NATURAL				
High Fire Manifold Pressure**	7.3 IN. WC	**Side Orifice Drill Size**			
Gas Regulator Outlet Pressure	14.1 IN. WC	**RPTD Job Pressure**	280.0	IN. WC	
Minimum Supply Pressure	56.2 IN. WC	**Max Design Pressure ***	280.0	IN. WC	
Wiring Diagram	G-J071639-2				
Gas Piping Diagram	PDG-J071639				
Oil Piping Diagram					
General Arrangement Drawing		**Addl. Dwg.**			
Remote Panel Diagram		**Addl. Dwg.**			
Additional Drawings					
Control Voltage	115V Single Phase	60 HZ	**Full Load Amps**	6.0	
Blower Motor Voltage	460V 3 PH	60 HZ	**Full Load Amps**	27.0	
Oil Pump Motor Voltage	PH	HZ	**Full Load Amps**		
Compressor Motor Voltage	PH	HZ	**Full Load Amps**		
Minimum Circuit Ampacity	43.6		**Gas Inlet Location**		
Ignition System	GAS PILOT SCANNER				
Diffuser Blade Setting	Blast Tube Flange Set				

Comments:
VERTICAL FGR INLET

****Approximate operating pressure at the Manifold Inlet for initial start-up. Final Pressure should be determined after checking actual flow with gas meter. Stack temperature, CO, CO2, O2, and Furnace Pressure will help in determining actual input when gas meter is not available for this unit.**

***All components are rated for the Max Design Pressure specified, that pressure must not be exceeded.**

BILL OF MATERIAL

Submittal

Customer: ENERGY CONSORTIUM IND INC - 100325 Purchase Order: P5905

Job Number: J071639θ Item: LNICM11-G-30 Qty: 1.00 Order Number: B050902 - 1

PFI Part No.	U/M	Qty	Material Description	Ship Loose
004660	FT	1	LD-500-1 LOW DENSITY 1/2 INCH 1000 DEGREE FIBERGLASS BRAIDED ROPE P/N 21032	
056312	EA	1	25 HP 3450 RPM 230/460/3 TEFC 256T FR. BM EM4118T HIGH EFFICIENCY BALDOR MOTOR	
060961	EA	1	SQM50-464R1A3R 140 IN-LBS, 25 SE COND, AGA58.4 SHAFT, ASZ12.30 POT, SIEMENS ACTUATOR	
060963	EA	2	SQM56.564R1A3R, 310 IN. LBS. 37 SEC., AG A58.4 SHAFT, ASZ12.30 POT, SIEMENS ACTUATOR	
062113	EA	1	CCE6SCA-M10RSA 3/8" SQ. TO 10MM ROUND SE T SCREW, 140 IN-LB/SQM40,41,5X TO DAMPER	
062122	EA	1	CHE6SCA-E8RSA 3/8" SQ TO 1/2" ROUND SET SCREW, 400 IN-LB/SQM 56.6 TO DAMPER	
062123	EA	1	CHE6SCA-E10RSA 3/8" SQ TO 5/8" ROUND SET SCREW, 400 IN-LB/SQM 56.6 TO DAMPER	
088507	EA	1	4825 EXAIR 1700 BTU/HR. THERMOSTAT ENCLO SURE COOLER 115V 50/60 HZ.	
090514	EA	1	200 D/62 AIR FOIL, 3450 RPM, CW CHICAGO WHEEL WITH 1-5/8" TAPERLOCK BUSHING	
090515	EA	1	200 D/62 72% WIDTH CHICAGO INLET CONE	
161100	EA	1	HGP-G 2-20 INCH ANTUNES HIGH GAS PRESSURE SWITCH, MANUAL RESET (VENTLESS)	L
163410	EA	1	LGP-H 1-7 PSI ANTUNES LOW GAS PRESSURE SWITCH, MANUAL RESET, 803113101	L
171100	EA	1	SMD8021206067 ANTUNES CONTROLS AIR SWITCH WITH COMP. FITTINGS .17-20" FLANGE MTG.	
201331	EA	2	3 INCH MAXON 5000CP GAS VALVE, CAST IRON BODY, FLANGED CONNECTIONS, WITH 23436 PROOF OF CLOSURE SWITCH, 6 SECOND TIMING	L
202650	EA	2	8040H8 3/8 INCH 15 PSI NEMA 4 120 VOLT 50/60 HZ. ASCO PILOT VALVE	
210210	EA	1	S302GF02V2AC9 N.O. 3/32 PORT 1/8 PIPE 115V. 150 PSI G.C. VALVE	
273600	EA	1	501221-1 112BV 3 INCH ECLIPSE MANUAL BUTTERFLY VALVE	
284600	EA	1	S262SG02N3GJ7 1-1/4 INCH N.O. VENT VALVE 1,710,000 BTU 1 INCH PD 120V 18.5 WATTS	L
302750	EA	1	210G 3 INCH MAXITROL REGULATOR WITH R11110-38 PINK 3-8" SPRING (CANADIAN	L

BILL OF MATERIAL

Submittal

Customer: ENERGY CONSORTIUM IND INC - 100325 Purchase Order: P5905

Job Number: J071639θ Item: LNICM11-G-30 Qty: 1.00 Order Number: B050902 - 1

PFI Part No.	U/M	Qty	Material Description	Ship Loose
302750...	EA...	1...	USE RESTRICTED SEE PRICING)	L...
302801	EA	1	325-3 3/8 INCH MAXITROL REGULATOR WITH R325C 10-22 RED SPRING	
310560	EA	1	R11110-1530 YELLOW 15-30 INCH SPRING FOR MAXITROL 210G REGULATOR	L
320001	EA	1	1092-PF-G 6000 VOLT 50/60 HZ. ALLANSON GAS IGNITION TRANSFORMER WITH GROUND WIRE	
333011	EA	1	B500-0571-5F 500VA 480/240/208 TO 120 50/60 HZ. MICRON STEPDOWN TRANSFORMER WITH FUSE BLOCK	
351580	EA	1	1/4 INCH T58570SSL FULL PORT BRONZE NIBCO BALL VALVE WITH LOCKING HANDLE	
351620	EA	1	1-1/4 INCH T5857066SSL FULL PORT BRONZE NIBCO BALL VALVE WITH LOCKING HANDLE	L
352580	EA	1	3 INCH FIGURE 611 HOMESTEAD THREADED LUBRICATED PLUG VALVE LESS E WRENCH WITH CGA LABEL	L
353200	EA	1	SIZE E HANDLE ONLY FOR HOMESTEAD 2-1/2 AND 3 INCH GAS COCK	L
398460	EA	1	ED512-4 FIREYE RJ12 CONNECTOR CABLE	
398510	EA	1	ED610 FIREYE MULTI-PORT CABLE ADAPTER FOR E110/ACC.	
399330	EA	1	YP100 FIREYE PROGRAMMER	
399331	EA	1	BLL510 FIREYE DISPLAY	
399332	EA	1	60-2814-1 FIREYE WIRING SUB BASE FOR USE WITH YP100 BURNER LOGICS PROGRAMMER	
399333	EA	1	YB110UV Y BURNERLOGIX CHASSIS/AMPLIFIER, 120VAC UV NON SELF CHECK	
463000	EA	1	0-15 INCH 2-1/2 INCH DIAL 1/4 INCH LOWER MOUNT CONNECTION 161963A US GAUGE	L
		1	0-15 INCH 2-1/2 INCH DIAL 1/4 INCH LOWER MOUNT CONNECTION 161963A US GAUGE	
463100	EA	1	0-20 0Z. 0-35 INCH 2-1/2 INCH DIAL 1/4 INCH LM CONNECTION WINTERS GAUGE PLP301 OR 161972A AMETEK US GAUGE	L
503231	EA	1	ATV71HD18N4 25 HP 400/480/3 SQ. D VFD, 41 AMP	
534610	EA	1	O RING, 2" O.D. X 1.875 I.D., BUNA N, 94 52K119 (PACKAGED 100 PER PACKAGE)	
555500	EA	3	PT320615 SCHRACK OR 55.33 8 120 00 00 FINDER 3PDT RELAY	

BILL OF MATERIAL
Submittal

Customer: ENERGY CONSORTIUM IND INC - 100325 Purchase Order: P5905

Job Number: J071639θ Item: LNICM11-G-30 Qty: 1.00 Order Number: B050902 - 1

PFI Part No.	U/M	Qty	Material Description	Ship Loose
555510	EA	3	PT78730 SCHRACK OR 94.73SMA FINDER SOCKET FOR 3PDT AND 55 SERIES RELAYS	
610400	EA	2	SLU-35 ILSCO GROUNDING LUG	
612010	EA	46	019904225 ENTRELEC D6/8.ADO 14-16 GAUGE ADO, SCREW TERMINAL, GREY BLOCK	
612130	EA	1	0199075.26 ENTRELEC D6/8.ADO 14-16 GAUGE AQO,TERMINAL RED (GAS VALVE)	
612200	EA	9	11511811 ENTRELEC M6/8 8MM TERMINAL BLOCK 50 AMP 8-22 GA. SCREW	
632050	EA	1	876-N5 EDWARDS WEATHERPROOF 120 VOLT ADAPTAHORN	
658400	EA	1	9001 TYPE KR-1U SQ. D PUSH BUTTON OPERATOR	
659500	EA	5	9001 KM-1 SQ. D LIGHT MODULE LIGHT ASSEMBLY BODY OIL TITE	
659510	EA	2	9001-R6 RED SQ. D COLOR CAP (GLASS)	
659530	EA	1	9001-W6 WHITE SQ. D COLOR CAP (GLASS)	
659560	EA	1	9001-G6 GREEN SQ. D COLOR CAP (GLASS)	
659570	EA	1	9001-L6 BLUE SQ. D COLOR CAP (GLASS)	
731000	EA	1	TYPE B 3/8 INCH KECKLEY OR NO. 11-M MUELLER Y STRAINER WITH 100 MESH S.S. SCREEN	L
731750	EA	1	TYPE B 3 INCH KECKLEY OR NO. 11-M MUELLER Y STRAINER WITH 100 MESH S.S. SCREEN	L
879060	EA	1	1/4 INCH STANDARD BLACK SQUARE HEAD PIPE PLUG	
910770	FT	5	3/8 INCH O.D. X .035 3003-0 ALUMINUM TUBE	L
912794	EA	1	CM9/14 REQ. REFRACTORY DIMENSIONS TAG PER DRAWING M380MC-5	
925020	EA	1	ATMR6 6 AMP 600V. CLASS CC NON-MOTOR RATED FERRAZ SHAWMUT FUSE	
926130	EA	2	ATDR-2.8 2.8 AMP FERRAZ SHAWMUT LOW PEAK DUAL ELEMENT TIME DELAY FUSE	
931290	EA	1	9001-KS11 2 POS.SQ. D SELECTOR SWITCH	
931350	EA	1	9001-B11 BLACK OPERATOR KNOB FOR KS43 SELECTOR SWITCH	
931420	EA	5	9001-KP SQ. D OIL TIGHT PILOT LIGHT OPERATOR	
931450	EA	2	9001-KA2 N.O. / SPST SQ. D CONTACT BLOCK	

BILL OF MATERIAL
Submittal

Customer: ENERGY CONSORTIUM IND INC - 100325 Purchase Order: P5905

Job Number: J071639θ Item: LNICM11-G-30 Qty: 1.00 Order Number: B050902 - 1

PFI Part No.	U/M	Qty	Material Description	Ship Loose
931620	EA	7	9001-KN200BP SQ. D LEGEND PLATE	
960200	EA	1	STANDARD NON ASBESTOS GASKET FOR 10 INCH COMPANION FLANGE	
980030	EA	2	1/4 INCH MODEL 740 BALL VALVE WITH TEE HANDLE	L
		1	1/4 INCH MODEL 740 BALL VALVE WITH TEE HANDLE	
980060	EA	1	3/8 INCH MODEL 740 FULL BORE BALL VALVE WITH LONG HANDLE P/N 55421	L
980450	EA	1	3 INCH MODEL 740 FULL PORT BALL VALVE WITH LONG HANDLE P/N 55100	L
A12330	EA	1	30 X 24 X 12 CPT VORTEX COOLER	
A13085	EA	1	16 X 20 CPT (7) SQD AND FIREYE VIEW	
A25517	EA	1	CM11 AIR INLET SILENCER ASSY DUAL ROW	
A26193	EA	1	SQM56 SERVO BRKT 2.5"-3" ECLIPSE "12"	
B12102	EA	14	CM11/11A 3/8 X 4 GAS JET WITH ORF	
B12152	EA	4	CM11 ROPE RETAINING BRKT	
B14037	EA	1	CM9-14 SIGHT GLASS COVER PLATE	
B14145	EA	1	CM11 TUBE ACCESS PLATE	
B14347	EA	1	CM11 DAMPER BACK PLATE	
B14348	EA	1	CM11/12 DAMPER FRONT PLATE	
B14349	EA	1	CM11 DAMPER TOP WRAP	
B14350	EA	2	CM11 DAMPER SIDE PLATES W/ BEARINGS	
B14351	EA	1	CM11 LONG DAMPER AXLE	
B14353	EA	2	CM11 DAMPER SHORT AXLE	
B14354	EA	1	CM11 DAMPER FRONT ANGLE	
B14355	EA	2	CM11 DAMPER BLADE STOP	
B14356	EA	1	CM11 DAMPER SAFTEY SCREEN	

BILL OF MATERIAL
Submittal

Customer: ENERGY CONSORTIUM IND INC - 100325 Purchase Order: P5905

Job Number: J071639θ Item: LNICM11-G-30 Qty: 1.00 Order Number: B050902 - 1

PFI Part No.	U/M	Qty	Material Description	Ship Loose
B14356...	EA...	1...		...
B14357	EA	1	CM11 DAMPER BACK ANGLE	
B14359	EA	1	CM11 DPR BASE RIGHT SIDE ANGLE	
B14360	EA	1	CM11 DPR BASE LEFT SIDE ANGLE	
B14903	EA	1	3/8-24 ALL THRD DPR CROSS LINK ROD 2.969	
B14905	EA	1	3/8-24 ALL THRD CROSS LINK 2.994"	
B20620	EA	1	CM11 222 CHICAGO AIR HOUSING WELD ASSEMBLY	
B20664	EA	1	CM11 200 MOTOR PLATE WELD ASSEMBLY 254T-256T F	
B20714	EA	1	CM11 BLAST TUBE WELD ASSEMBLY 14 SPUDS	
B20760	EA	1	CM11 7.625" DIA DIFFUSER WELD ASSEMBLY	
B20798	EA	1	10" IFGR 90 DEGREE ADAPTOR ASSEMBLEY WITH DRAIN SHORTER	
B20812	EA	3	CM11 DAMPER BLADE WELD ASSY	
B30013	EA	1	CM11 STRAIGHT GAS GUN ASSEMBLY	
B30303	EA	1	10 INCH SINGLE BLADE IFGR DAMPER ASSEMBLY	
E10610	EA	2	PANEL BOX MOUNTING BRACKET (BURNER)	
E12000	EA	1	C-P2016 HOFFMAN CHASSIS	
E12004	EA	1	C-P3024 HOFFMAN CHASSIS	
E12011	EA	1	A-14P12 HOFFMAN CHASSIS	
M16034	EA	1	SQM5x 10" IFGR BRACKET	
M16091	EA	1	SQM56 SERVO BRKT CMAX DAMPER SCC COUP	
M20058	EA	1	5/8"I.D. DUAL CROSS STRAP ARM ASSY TAPD	
M20065	EA	2	2.125 DAMPER ARM ASSY 5/8"I.D. TAPPED	

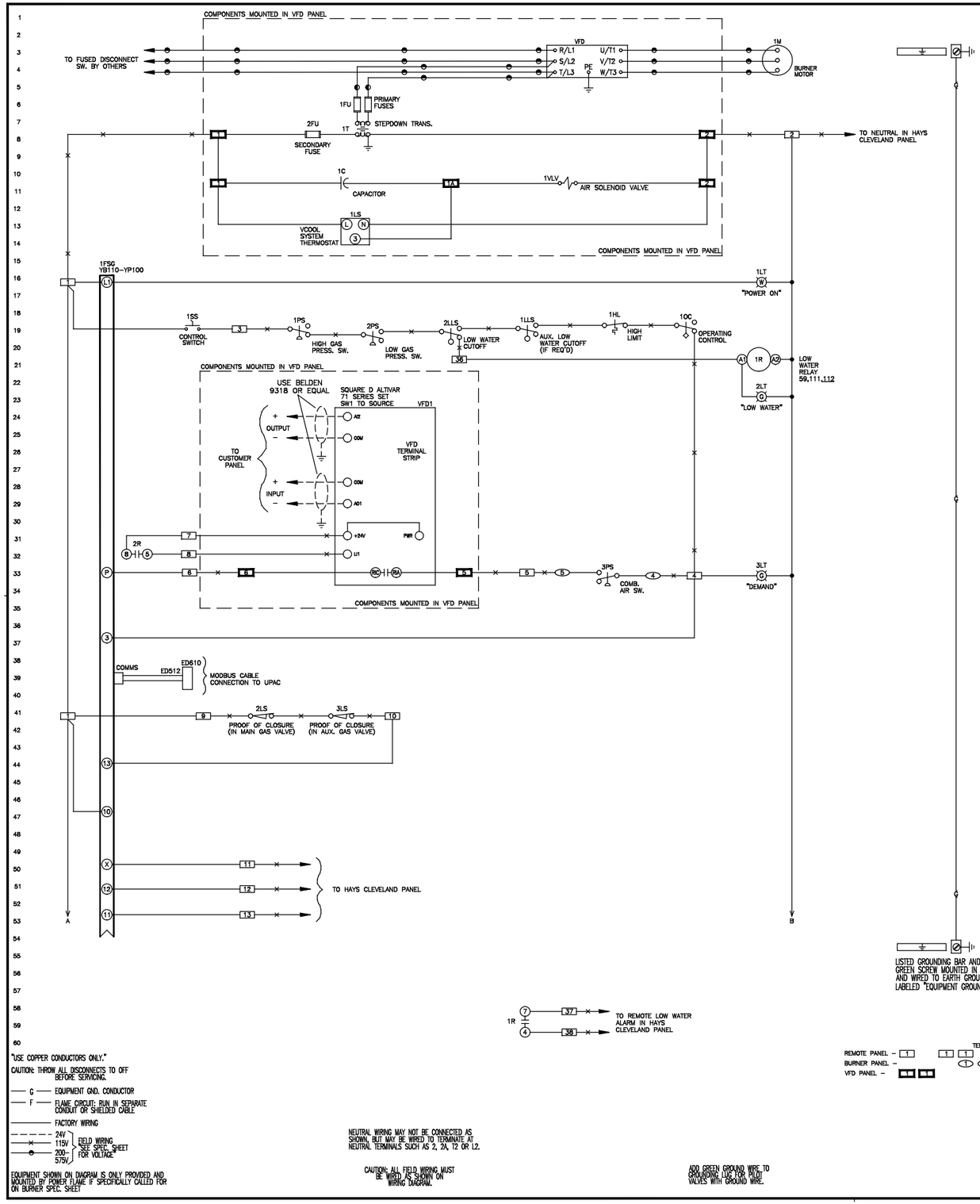
BILL OF MATERIAL

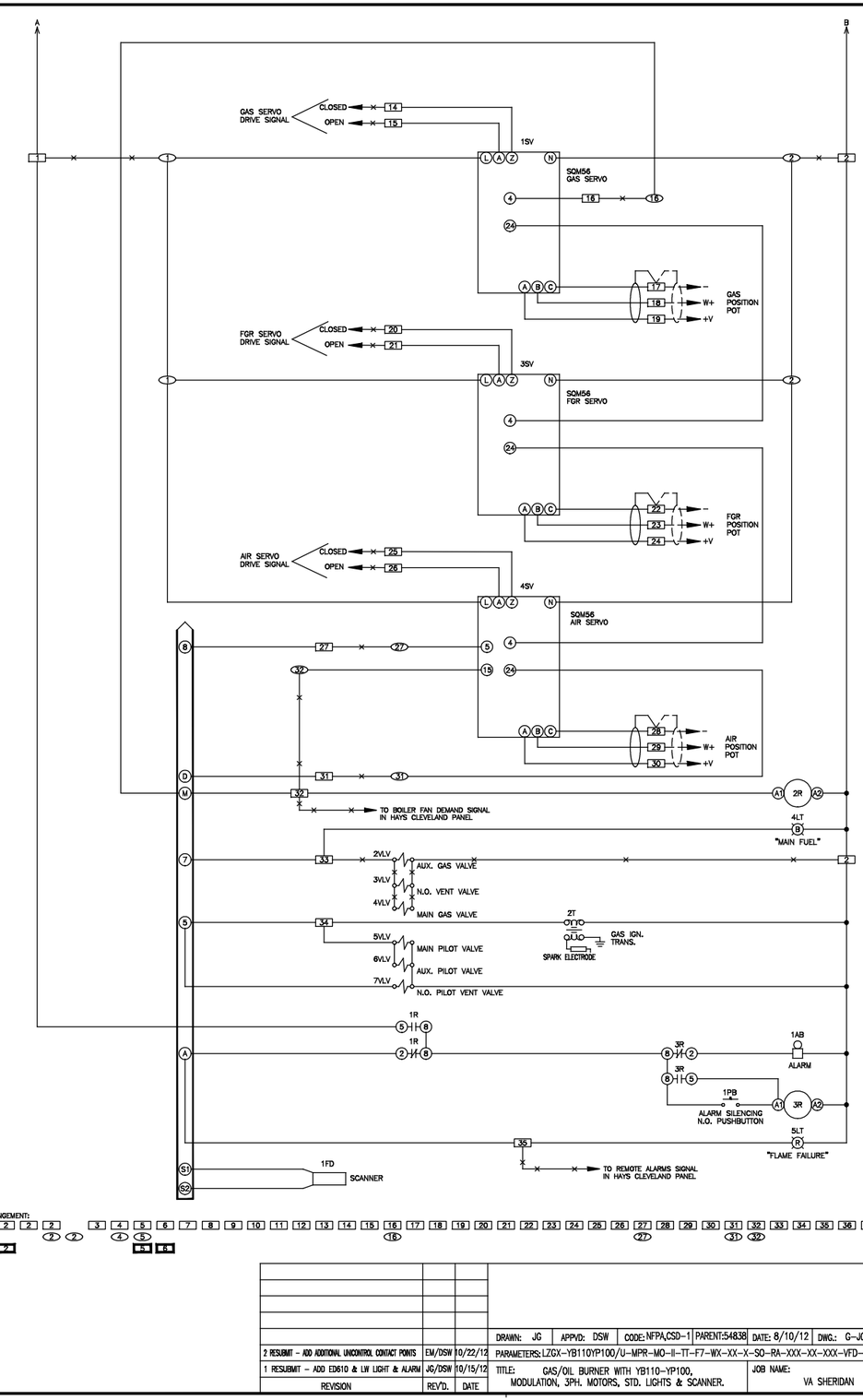
Submittal

Customer: ENERGY CONSORTIUM IND INC - 100325 Purchase Order: P5905

Job Number: J071639θ Item: LNICM11-G-30 Qty: 1.00 Order Number: B050902 - 1

PFI Part No.	U/M	Qty	Material Description	Ship Loose
M20065...	EA...	2...		...
M20112	EA	1	LARGE BURNER PED PLATE WELD ASSEMBLY	
R19254	EA	1	10" IFGR INLET FLANGE	
V13231	EA	2	10" ROUND ELLIPTICAL BLADE	
V13232	EA	2	10" ROUND DAMPER AXLE 1/2" ROD	
X02034	EA	2	1/4 INCH STD BLACK HALF COUPLING	
X02095	EA	1	1/8 90 DEGREE BRASS STREET ELBOW 116-2	
X02402	EA	4	1/2" RULON SLEEVE BEARING, 6362K219	
X02450	EA	12	40MST FAFNIR FLANGETTE NOTE: PACKAGED TWO PER BOX	
X02470	EA	6	RA010RRB FAFNIR BALL BRNG. 5/8	
X02622	EA	1	1/4 BRASS HEX NIPPLE 122-4	L
X02677	EA	1	3/8 X 1/4 COMP-MP STR 68-64	L
X04289	EA	4	3/8-24 ROD END BALL JOINT RIGHT 6072K174	
X09246	EA	15	10-32 X 1-1/4 18-8 S.S. ROUND PHILLIPS H EAD MACHINE SCREW	
X09252	EA	4	3/8 X 1 X 25/64 X .050 18-8 S.S. FLAT WA SHER	
X09253	EA	4	3/8 X 1/2 HEX SOCKET HEAD SHOULDER SCREW	
X09292	EA	12	1/4-20 X 3/4 CARRIAGE BOLT GRADE 2 (ZINC PLATED)	
X09301	EA	2	1/4-20 DOUBLE TAB WELD NUT	
		2	1/4-20 DOUBLE TAB WELD NUT	
X09346	EA	8	1/4-20 X 3/4 HEX HEAD CAP SCREW	
X09363	EA	4	10-32 X 1/2 RND. SLT MACH. SCREW	
X09412	EA	12	3/8-16 X 1-1/2 HEX HD CAP SCREW	
X09557	EA	15	10-32 NYLON INSET HEX LOCK NUT 90631A411	
X09566	EA	4	5/16-18 WHIZ NUT	
X09569	EA	4	3/8-24 RIGHT HAND HEX NUT PLATED	
X09731	EA	1	2 INCH DIA. 1/8 INCH THICK BOROSILICATE SIGHT GLASS 8477K48	
X09795	IN	44	173220.05 PREPUNCHED DIN RAIL	
X09890	EA	1	A-PWK53NF HOFFMAN WINDOW KIT	
X09972	EA	1	A-1412NF NEMA 4 HOFFMAN ENCLOSURE 14 X 12 X 6	





TERMINAL STRIP ARRANGEMENT:

REMOTE PANEL – 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38

BURNER PANEL – 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38

VFD PANEL – 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38

"USE COPPER CONDUCTORS ONLY."

CAUTION: THROW ALL DISCONNECTS TO OFF BEFORE SERVICING.

— G — EQUIPMENT GND. CONDUCTOR

— F — FLAME CIRCUIT: RUN IN SEPARATE CONDUIT OR SHIELDED CABLE

——— FACTORY WIRING

– – – – 24V
—×— 115V
—●— 200-575V
} FIELD WIRING SEE SPEC. SHEET FOR VOLTAGE

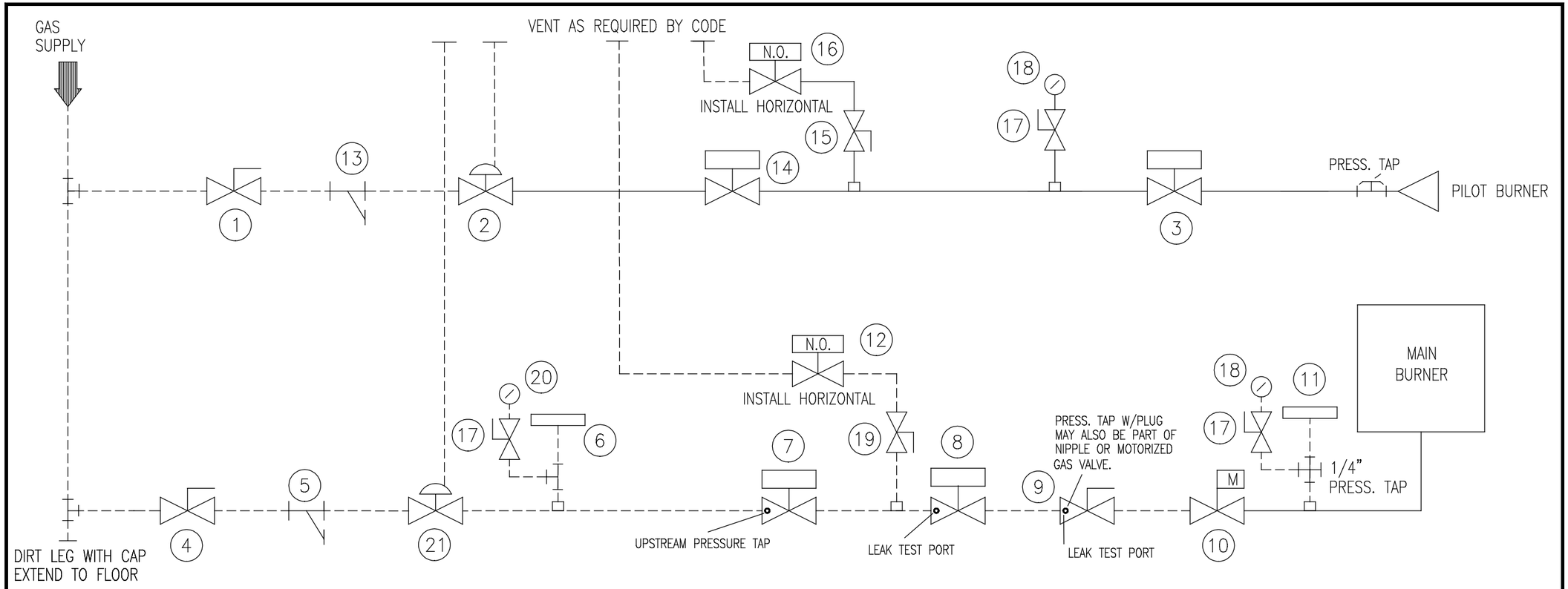
EQUIPMENT SHOWN ON DIAGRAM IS ONLY PROVIDED AND MOUNTED BY POWER FLAME IF SPECIFICALLY CALLED FOR ON BURNER SPEC. SHEET

NEUTRAL WIRING MAY NOT BE CONNECTED AS SHOWN, BUT MAY BE WIRED TO TERMINATE AT NEUTRAL TERMINALS SUCH AS 2, 2A, 12 OR L2.

CAUTION: ALL FIELD WIRING MUST BE WIRED AS SHOWN ON WIRING DIAGRAM.

ADD GREEN GROUND WIRE TO GROUNDING LUG FOR PILOT VALVES WITH GROUND WIRE.

			DRAWN: JG	APPV'D: DSW	CODE: NFPA,CSD-1	PARENT:54838	DATE: 8/10/12	DWG.: G-J071639-2
2 RESUBMIT – ADD ADDITIONAL UNCONTROL CONTACT POINTS	EM/DSW	10/22/12	PARAMETERS: LZGX-YB110YP100/U-MPR-MO-II-TT-F7-WX-XX-X-SO-RA-XXX-XX-XXX-VFD-NFPA					
1 RESUBMIT – ADD ED610 & LW LIGHT & ALARM	JG/DSW	10/15/12	TITLE: GAS/OIL BURNER WITH YB110-YP100, MODULATION, 3PH. MOTORS, STD. LIGHTS & SCANNER.				JOB NAME: VA SHERIDAN	
REVISION	REV'D.	DATE						



ITEM	PART NUMBER	DESCRIPTION
1	980060	PILOT SHUTOFF COCK
2	302801	PILOT REGULATOR
3	202650	MAIN PILOT VALVE
4	980450	MAIN GAS SHUTOFF COCK
5	731750	MAIN GAS 'Y' STRAINER
6	163410	LOW GAS PRESS. SW.
7	201331	AUX. GAS VALVE W/ P.O.C.
8	201331	MAIN GAS VALVE W/ P.O.C.
9	352580 & 353200	MAIN GAS LEAK TEST COCK
10	273600	BUTTERFLY VALVE
11	161100	HIGH GAS PRESS. SW.
12	284600	N.O. VENT VALVE
13	731000	PILOT 'Y' STRAINER
14	202650	AUX. PILOT VALVE
15	351580	PILOT N.O. VENT VALVE LOCKING COCK
16	210210	PILOT N.O. VENT VALVE
17	980030	GAUGE COCK
18	463000	PRESSURE GAUGE
19	351620	N.O. VENT VALVE LOCKING COCK
20	463100	PRESSURE GAUGE
21	302750	MAIN GAS PRESS. REGULATOR

NOTE: WHEN PILOT GAS PRESS. REG. IS AGA CERTIFIED DEVICE WITH INTEGRAL LEAK LIMITING ORIFICE; SUCH AS RV-20, RV-10 AND RV-12, VENT LINE FOR PILOT GAS PRESS. REG. MAY NOT BE REQ'D. UNLESS SPEC'D. BY OTHER CODES. (NO PROVISION FOR EXTERNAL VENTING ON RV-10 & 12) (RV-20 HAS OPTIONAL VENTING WITH P/N. 30912)

REFER TO SPECIFIC REGULATOR LITERATURE FOR RECOMMENDED STRAIGHT RUN OF PIPING BEFORE/AFTER REGULATOR AND SENSING LINE (IF APPLIC.)

EQUIPMENT SHOWN ON DIAGRAM IS ONLY PROVIDED AND MOUNTED BY POWER FLAME IF SPECIFICALLY CALLED FOR ON BURNER SPEC. SHEET.

——————— FACTORY PIPED
- - - - - - - FIELD PIPED

CAUTION: ALL FIELD PIPED COMPONENTS MUST BE MOUNTED IN THE PROPER LOCATION AND PROPER DIRECTION OF GAS FLOW.

REVISION	REV'D.	DATE

Power Flame Incorporated
2001 SOUTH 21st STREET PARSONS, KANSAS 67357
PHONE (620) 421-0480 FAX (620) 421-0948

DRAWN:	APPVD:	DATE:	PARENT:	DWG.:
JG	DSW	8/10/12	56480	PDG-J071639

DRAWING PARAMETERS: N/A | CODE: NFPA

TITLE: GAS PIPING FOR MODULATION BURNER

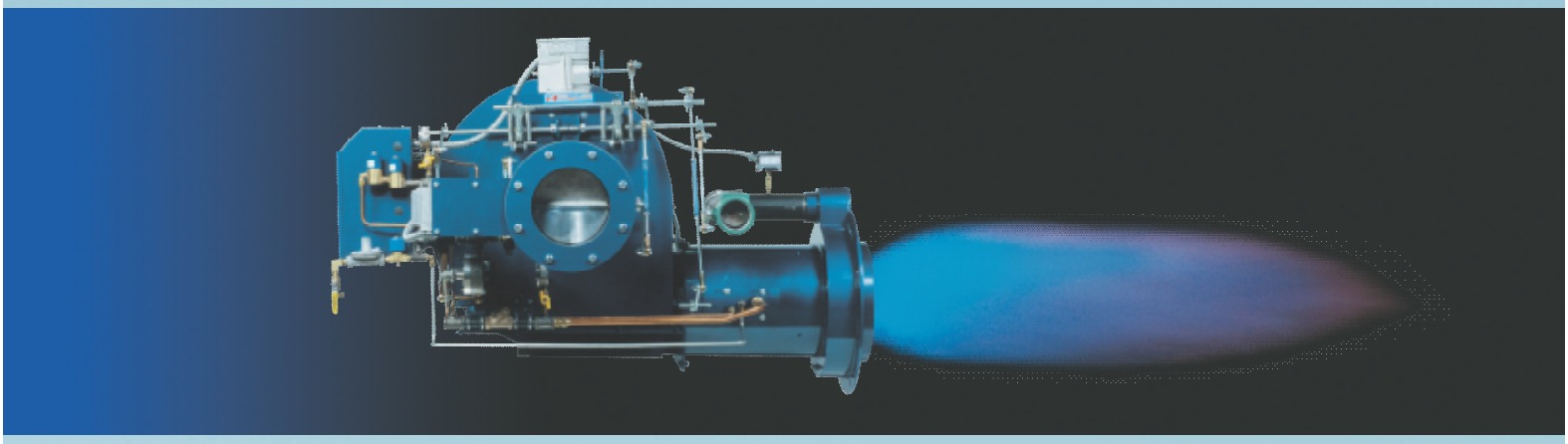
JOB NAME: VA SHERIDAN

MODEL CM
FORCED DRAFT
BURNERS

GAS
AND OIL

1,260,000 –
92,400,000
BTU/HR

Power Flame® Type CMAX



Power Flame's Versatile High Capacity Gas / Oil Burner

The Power Flame CMAX burner offers state-of-the-art technology for maximum combustion efficiency and operating performance when firing all types of oil and gaseous fuels.

Designed specifically for today's firetube boilers, the CMAX burner utilizes a unique firing head design which provides stable combustion over a wide turndown range (10:1 on gas and 8:1 on air atomized oil.)

The low NOx option using induced flue gas recirculation provides minimal emissions on gaseous and liquid fuels.

The "easy access" door on the burner blast tube allows convenient maintenance of the firing head components without disturbing either the fuel piping or electrical connections.

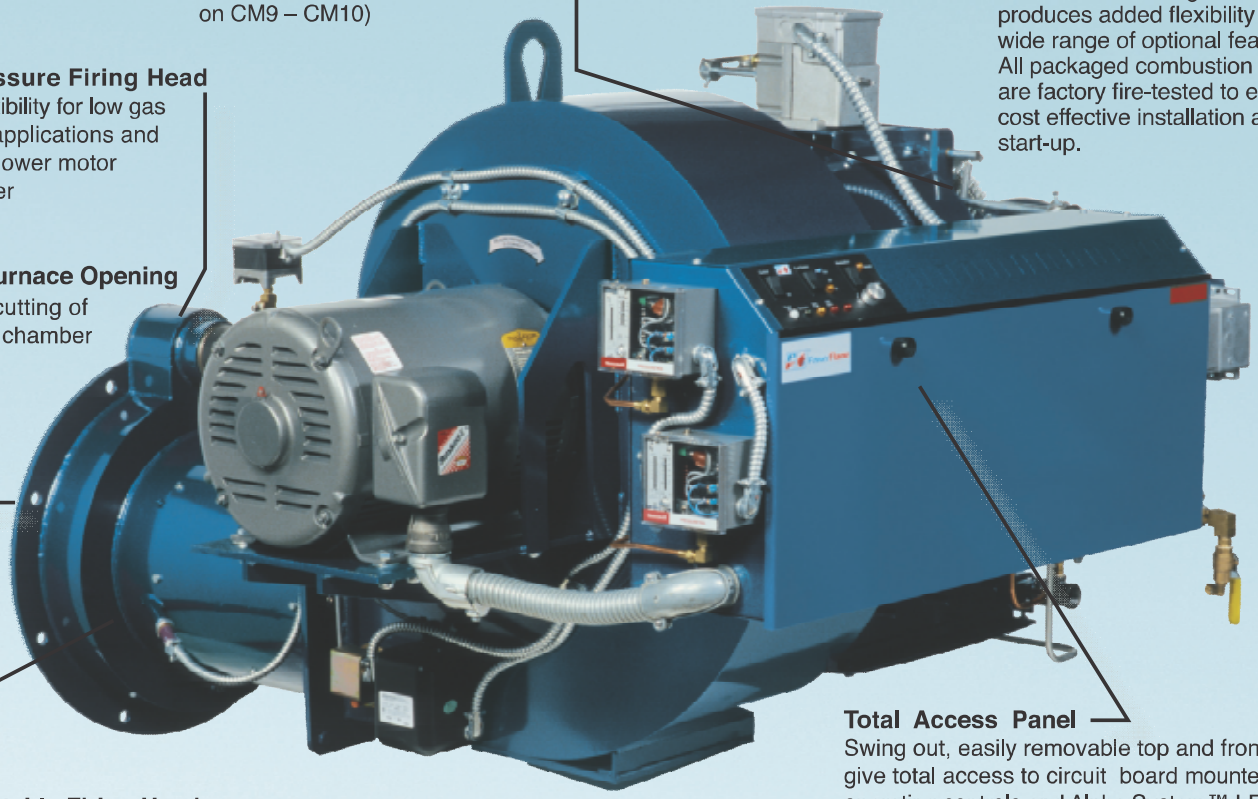
The bottom or top-entry, gas manifold connection facilitates left or right hand configurations.

Our modular design concept produces added flexibility for a wide range of optional features. All packaged combustion systems are factory fire-tested to ensure cost effective installation and start-up.

Characterized Fuel Metering
Varicam® provides adjustable and accurately repeatable fuel air ratios throughout the firing range (optional on CM9 – CM10)

Low Pressure Firing Head
Added flexibility for low gas pressure applications and reduced blower motor horsepower

Circular Furnace Opening
No special cutting of combustion chamber front plate



Adjustable Firing Head
Produces optimum fuel-air mixture within the primary combustion zone

Total Access Panel
Swing out, easily removable top and front panels give total access to circuit board mounted operating controls and Alpha System™ LED Indicators & Switches

CM–0105 Rpt. 1109

Power Flame

The Power to Manage Energy

Unique firing head produces stable combustion over wide turndown.

STANDARD EQUIPMENT

- 3450 RPM Motor, backward inclined blower wheel, control panel with Alpha System™ LED Indicators (Power, Demand, Main Fuel, FSG Alarm & Customer Selectable), control switches and manual potentiometer.
- Gas electric pilot and ignition transformer
- Combustion air flow safety switch
- Flame safeguard with prepurge and interrupted pilot

GAS BURNER

- Pressure regulators, pilot and main gas cocks
- Adjustable gas firing head
- UV scanner

AIR ATOMIZED OIL BURNER

- Nozzle assembly with oil and atomizing air trains
- Air compressor
- Remote pump assembly
- UV scanner

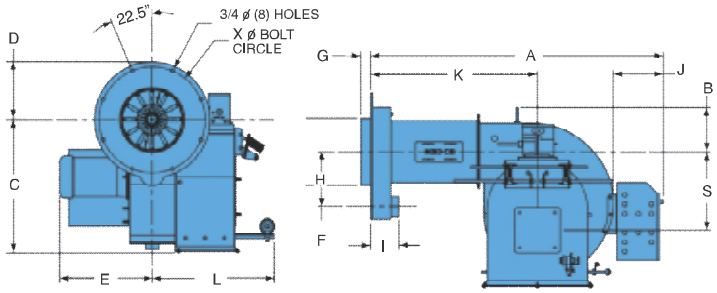
ADDED FEATURES

X – Standard **O** – Optional

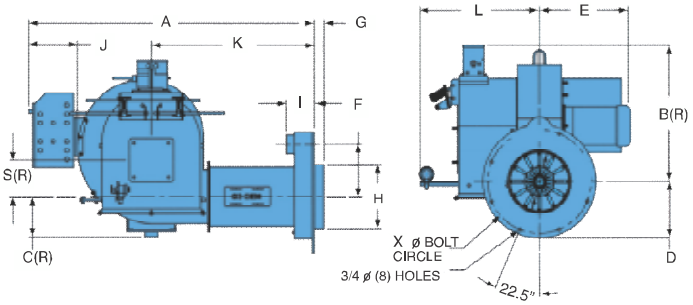
	CM9	CM9A	CM9B	CM10	CM10A	CM10B	CM10C	CM11	CM11A	CM12	CM12A	CM13	CM14
Modulation with automatic air control	X	X	X	X	X	X	X	X	X	X	X	X	X
Dual gas and oil safety valves	X	X	X	X	X	X	X	X	X	X	X	X	X
High and low gas pressure switches	X	X	X	X	X	X	X	X	X	X	X	X	X
Manual / Auto switch & manual potentiometer	X	X	X	X	X	X	X	X	X	X	X	X	X
Director™ graphic annunciator	O	O	O	O	O	O	O	O	O	O	O	O	O
Varicam™ characterized fuel metering	O	O	O	O	X	X	X	N/A	N/A	N/A	N/A	N/A	N/A
Characterized gas fuel metering	O	O	O	O	O	O	O	X	X	X	X	X	X
IFGR for low NOx operation	O	O	O	O	O	O	O	O	O	O	O	O	O

NOTE: CM11 through CM14 are not UL Listed – assembled with UL Recognized Components

MODEL CM (Forced Draft Burner)



MODEL CMR (For low centerline applications)



DIMENSIONS (Inches) Standard Models

RATINGS & SPECIFICATIONS

Burner Model	A	B	B(R)	C	C(R)	D	E	F	**** G	H	I	J	K	L	S	S(R)	X	CAPACITY* # 2 OIL GPH MAX.	CAPACITY* NAT. GAS MBH MAX.	CAPACITY* NOMINAL BOILER H.P. MAX.	BLOWER MOTOR H.P.	GAS** PRESS. REQ'D (IN.W.C.)
CM9–G(O)–30	58	8 3/4	28 1/2	26 15/16	8 5/16	11 3/4	18 13/16	10 13/16	2	13 1/4	5 5/8	9 7/8	33 3/32	24 13/16	15 17/32	7 19/32	21 1/2	90.0	12,600	300	3.0	21.0
CM9A–G(O)–30	58	8 3/4	28 1/2	26 15/16	8 5/16	11 3/4	18 13/16	10 13/16	2	13 1/4	5 5/8	9 7/8	33 3/32	24 13/16	15 17/32	7 19/32	21 1/2	122.0	17,040	406	5.0	44.0
CM9B–G(O)–30	58	8 3/4	28 1/2	26 15/16	8 5/16	11 3/4	18 13/16	10 13/16	2	13 1/4	5 5/8	9 7/8	33 3/32	24 13/16	15 17/32	7 19/32	21 1/2	152.0	21,300	507	7.5	64.0
CM10–G(O)–30	63	11 5/16	32 1/8	28 3/8	7 25/32	11 3/4	21 5/8	10 13/16	2	13 1/4	5 5/8	10 3/16	35 5/8	33	10 1/16	13 3/32	21 1/2	158.0	22,165	528	10.0	73.0
CM10A–G(O)–30	63	11 5/16	32 1/8	28 3/8	7 25/32	11 3/4	21 5/8	10 13/16	2	13 1/4	5 5/8	10 3/16	35 5/8	33	10 1/16	13 3/32	21 1/2	180.0	25,200	600	15.0	93.0
CM10B–G(O)–30	63	11 5/16	32 1/8	28 3/8	7 25/32	11 3/4	21 5/8	11 13/16	2	15 1/8	5 5/8	10 3/16	35 5/8	33	10 1/16	13 3/32	21 1/2	218.0	30,500	726	15.0	120.0
CM10C–G(O)–30	63	11 5/16	32 1/8	28 3/8	7 25/32	11 3/4	21 5/8	11 13/16	2	15 1/8	5 5/8	10 3/16	35 5/8	33	10 1/16	13 3/32	21 1/2	257.0	36,000	857	20.0	128.0
CM11–G(O)–30	68	12 3/4	37 9/16	34 11/16	9 3/16	12 11/16	25 13/16	13 7/32	2	17 1/8	5 11/16	9 3/4	37 7/8	33 1/4	15 13/32	15 13/32	23 3/8	329.0	46,000	1095	25.0	77.0
CM11A–G(O)–30	68	12 3/4	37 9/16	34 11/16	9 3/16	12 11/16	27 1/4	13 7/32	2	17 1/8	5 11/16	9 3/4	37 7/8	33 1/4	15 17/32	15 13/32	23 3/8	378.0	53,000	1260	30.0	101.0
CM12–G(O)–40	84	14 1/4	44 7/8	42 5/16	13 3/16	13 11/16	26 7/8	14 7/32	2	19 1/8	5 3/4	9 3/4	48 15/16	38	18 3/4	18 3/4	25 3/8	429.0	60,000	1430	60.0	140.0
CM12A–G(O)–40	84	14 1/4	44 7/8	42 5/16	13 3/16	13 11/16	26 7/8	14 7/32	2	19 1/8	5 3/4	9 3/4	48 15/16	38	18 3/4	18 3/4	25 3/8	456.0	63,850	1520	75.0	140.0
CM13–G(O)–40	100	16	***	46 1/4	***	14 11/16	22 3/4	15 1/4	2	21 1/4	5 3/4	14	57 1/4	44 5/8	21 7/8	***	27 3/8	540.0	75,600	1800	100.0	280.0
CM14–G(O)–40	100	16	***	46 1/4	***	15 11/16	36 3/16	16 1/4	2	23 1/4	5 3/4	14	57 1/4	44 5/8	21 7/8	***	29 3/8	660.0	92,400	2200	125.0	280.0

Note 1: Dimensions can vary with optional equipment and system arrangements. Final piping connections should be determined after installation.

Note: * PFI certified capacities listed are based on +1.00" w.c.(CM9) / +2.50" w.c. (CM10) / +4.00" w.c. (CM11) / +8.00" w.c. (CM12–14) combustion chamber pressure. Refer to capacity curves for derates based upon combustion chamber pressure.

** Gas pressures listed are at the inlet to the main shutoff cock and required to obtain PFI certified rating with the standard UL gas train. Optional gas trains are available for lower pressures.

*** Consult factory

**** Refer to O & M manual for proper insertion and quarl dimensions.

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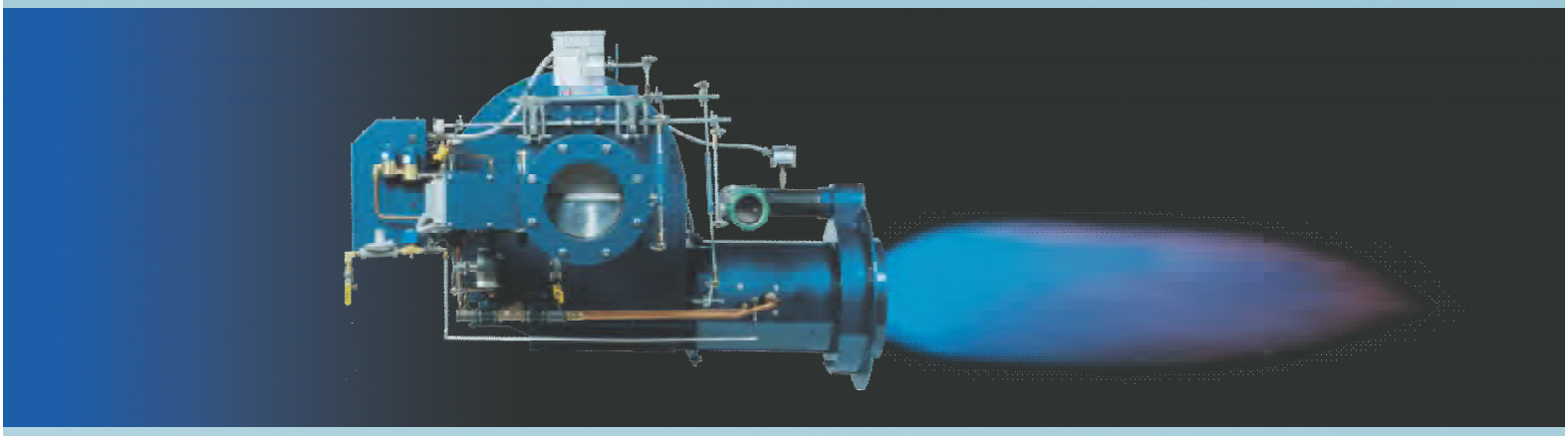
Printed in U.S.A.

NOVA LOW NOx COMBUSTION SYSTEMS

GAS 300,000 – OIL 92,400,000 BTU/HR

Power Flame® Nova



Power Flame's Advanced Technology Low Emission Burners The Power of Choice

Proven experience and flexibility of choice in NOx reduction techniques are key to successful emission control. Combustion chamber geometry and construction, as well as heat release levels, are among the more important determining factors in the choice of low NOx application equipment.

Heat exchanger designs vary significantly, and the choice of the most appropriate NOx reduction method is an essential element in meeting both the current and future emission standards.

The Power Flame Nova concept provides U.L. listed, factory tested packages capable of using a wide range of NOx reduction techniques. In most applications requiring sub 20 or 30 PPM NOx on gas firing, we can incorporate our cost effective Induced Flue Gas Recirculation(IFGR) system.

Designed to be fitted on a wide variety of our burner models, particularly the C, AC and CMAX burners, the IFGR system uses up to 15% inert flue gases to reduce NOx emissions to the required levels. Power Flame engineering will tailor a low emissions burner system to your job specific requirements to provide optimum performance and maximum NOx reductions.

Years of dependable field performance from hundreds of Nova system applications (more than any other commercial / industrial burner company) ensures your emission levels will be obtained.

Low NOx Adaptor
Complete assembly including modulating IFGR damper and on/off IFGR purge damper.

Total Access Panel
Swing out, easily removable top and front panels give total access to circuit board mounted operating controls and Alpha System™ LED indicators and switches. Optional remote panels for pedestal or wall mount are available.

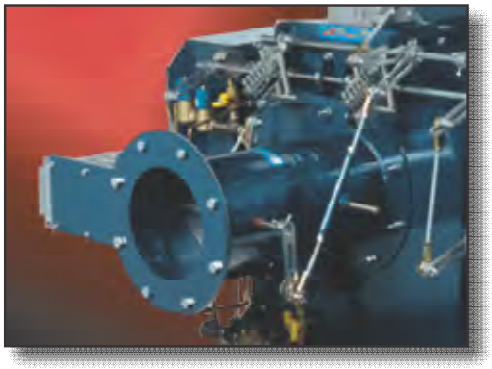
Linkage Controls (Standard)
Single modulating motor and easy to set linkage assembly minimizes start-up. Optional electronic linkageless controls are available.

PowerFlame

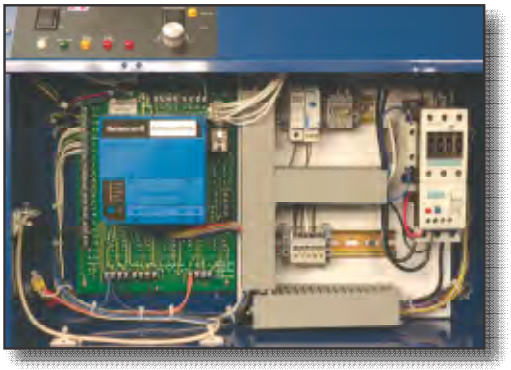
The Power to Manage Energy

State of the art Director SCS Touch Screen Controls are available on all models.

FEATURES



The Induced Flue Gas Recirculation (IFGR) Low NOx adapter is available for vertical connections (shown left) or horizontal connections (shown above)



All LNIC, AC or CMAX Burners are provided with our exclusive Alpha System™ LED Indicators, switches and printed circuit boards.

LOW NOx BURNER SYSTEMS: Capacity (see notes below)

Nat.GAS/ MBH MAX.	GPH #2 oil MAX.		20 PPM GAS	30 PPM GAS	60 PPM GAS	90 PPM #2 OIL
835	6.0	LNIC1-G(O)-10	•	•		
1,160	8.3	LNIC1-G(O)-12	•	•		
1,870	13.4	LNIC2-G(O)-15	•	•		
2,125	15.2	LNIC2-G(O)-20A	•	•		
2,620	18.7	LNIC2-G(O)-20B	•	•		
3,570	25.5	LNIC3-G(O)-20	•	•		
4,010	28.7	LNIC3-G(O)-25	•	•		
4,470	31.9	LNIC3-G(O)-25B	•	•		
5,360	38.3	LNIC4-G(O)-25	•	•		
6,670	47.6	LNIC4-G(O)-30	•	•		
8,925	63.8	LNIC5-G(O)-30	•	•		
9,815	70.1	LNIC5-G(O)-30B	•	•		
12,080	86.3	LNIC6-G(O)-30	•	•		
14,470	103.4	LNIC7-G(O)-30	•	•		
16,200	115.7	LNIC8-G(O)-30	•	•		
2,790	19.9	LNIAC3-G(O)-20	•	•		•
3,600	25.7	LNIAC3-G(O)-25	•	•		•
4,015	28.8	LNIAC3-G(O)-25B	•	•		•
4,820	34.5	LNIAC4-G(O)-25	•	•		•
6,000	42.9	LNIAC4-G(O)-30	•	•		•

Nat.GAS/ MBH MAX.	GPH #2 oil MAX.		20 PPM GAS	30 PPM GAS	60 PPM GAS	90 PPM #2 OIL
8,030	57.4	LNIAC5-G(O)-30	•	•		•
8,585	61.3	LNIAC5-G(O)-30B	•	•		•
10,710	76.5	LNIAC6-G(O)-30	•	•		•
14,470	103.4	LNIAC7-G(O)-30	•	•		•
16,200	115.7	LNIAC8-G(O)-30	•	•		•
11,800	84.0	LNICM9-G(O)-30	•	•	•	•
14,800	106.0	LNICM9A-G(O)-30	•	•	•	•
17,500	125.0	LNICM9B-G(O)-30	•	•	•	•
21,100	151.0	LNICM10-G(O)-30	•	•	•	•
22,600	161.0	LNICM10A-G(O)-30	•	•	•	•
25,700	183.0	LNICM10B-G(O)-30	•	•	•	•
32,900	235.0	LNICM10C-G(O)-30	•	•	•	•
39,100	279.0	LNICM11-G(O)-30	•	•	•	•
45,050	320.0	LNICM11A-G(O)-30	•	•	•	•
51,000	364.0	LNICM12-G(O)-40	•	•	•	•
63,400	453.0	LNICM12A-G(O)-40	•	•	•	•
75,600	540.0	LNICM13-G(O)-40	•	•	•	•
92,400	660.0	LNICM14-G(O)-40	•	•	•	•

NOTES:

1. For 20 and 30 PPM on gas and 90 PPM on oil induced flue gas recirculation is required. For 60 PPM on gas, no IFGR is required. Oil NOx emissions are based upon fuel bound nitrogen not exceeding 0.1% by weight.
2. C1 thru C8. Capacities are based on +0.2" w.c. combustion chamber pressure and 30ppm NOx. CM9 burners are rated at +1.0" w.c. combustion chamber pressure and CM10 burners are rated at +2.5" w.c. combustion chamber pressure.
   CM11 and CM11A are rated at +4.0" w.c combustion chamber pressure.
   CM12 through CM14 are rated at +8.0" w.c.combustion chamber pressure.
   Refer to capacity curves for derates based upon combustion chamber pressure.
   Stated capacities are based upon the use of 15% induced flue gas recirculation.

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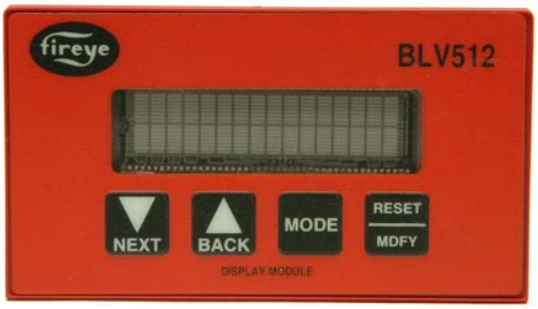
Printed in the USA



BLV512
BLL510
DISPLAY MODULES FOR USE WITH THE FIREYE® BurnerLogiX™ CONTROL SYSTEM

c UL US LISTED

FM APPROVED

DESCRIPTION

The BurnerLogix system offers optional vacuum fluorescent (VFD) and liquid crystal (LCD) displays that may be either plugged in or mounted remotely to give full language descriptors of current status and diagnostic lockout information.

In order to change the factory default parameters stored in the programmer module an optional keypad/display (BLV512 or BLL510) is required. All configurable parameters are stored within the PROGRAM SETUP sub-menu. The keypad/display module provides tactile feedback keys that are used to access the sub-menus inherent in the BurnerLogix system.

The optional alpha-numeric display is made up of 2 lines by 16 characters per line and is available in either vacuum fluorescent or liquid crystal formats. The advantage of VFD is high brightness and extended temperature range to -40°F. Both displays contain a fully functional keypad allowing the user to easily scroll through the various menus to view the current operating status, review programmer configuration, and lockout history.

When mounted remotely using kits 129-178-4 or 129-178-8, each display meets NEMA 4X requirements. Refer to instruction sheet 133-675 for details.

INSTALLATION PROCEDURE

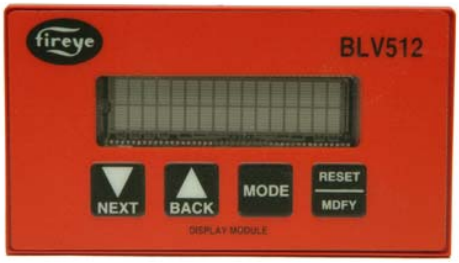
The display module is held into the BurnerLogix chassis/amplifier by mounting tabs designed into the display housing.

Using the thumb and index finger, grasp the left and right edges of the blank display module and pull forward until removed. Insert one end of the supplied 4 inch display cable into the jack located in the back of the display module. Plug the other end of the cable into the jack located inside the chassis/amplifier module.

Using the thumb and index finger, grasp the left and right edges of the blank display module and insert it into the compartment of the chassis/amplifier module. Push the unit into the unit until a positive click is realized.

Refer to bulletin BL-1001 for complete information

Keypad Description



The NEXT key is used to scroll down through the various menus and is also used to increment the value when in the modify mode. The BACK key is used to scroll up through the menus and is also used to decrement the value when in the modify mode. The MODE key is used to enter a sub-menu when the displayed item indicates a sub-menu with a right facing arrow and also to exit the sub-menu and move on to the next main menu item. The RESET/MDFY key is used to reset the BurnerLogiX from a lockout condition, force a recycle of the programmer, indicate to the system the value displayed is to be modified or when done with the modification.

List of display of main menu items in BurnerLogiX:

L1-3 OPEN	current operating status
BNR HOURS	total hours terminal 7 (main fuel) is energized
BNR CYCLES	total burner cycles
BNR LOCKOUTS	total system lockouts
SYS HOURS	total hours installed
PROGRAM SETUP >	review and set program parameters
LOCKOUT HISTORY >	last 10 lockouts with burner hour and cycle time stamp.
SYSTEM INFO >	view flame signal averages, M-D and M-8 status, select language, clear history feature.

TO VIEW AND MODIFY A PROGRAMMABLE PARAMETER:

On display module BLV512 or BLL510, use the NEXT or BACK key to scroll to PROGRAM SETUP. Press the MODE key to enter the submenu showing all program setup parameters. Pressing the MODE key while in the sub-menu will exit the sub-menu, and the next main menu item will be displayed. While in the sub-menu, pressing the NEXT key will scroll forward through the sub-menu. Pressing the BACK key will scroll backward through the sub-menu. When a modifiable parameter is displayed, pressing the RESET/MDFY key will allow the displayed parameter to be modified. Use the NEXT or BACK keys to select the value to suit the application and when done, press the RESET/MDFY to save the value to memory.

NOTICE

When Fireye products are combined with equipment manufactured by others and/or integrated into systems designed or manufactured by others, the Fireye warranty, as stated in its General Terms and Conditions of Sale, pertains only to the Fireye products and not to any other equipment or to the combined system or its overall performance.

WARRANTIES

FIREYE guarantees for *one year from the date of installation or 18 months from date of manufacture* of its products to replace, or, at its option, to repair any product or part thereof (except lamps, electronic tubes and photocells) which is found defective in material or workmanship or which otherwise fails to conform to the description of the product on the face of its sales order. **THE FOREGOING IS IN LIEU OF ALL OTHER WARRANTIES AND FIREYE MAKES NO WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED.** Except as specifically stated in these general terms and conditions of sale, remedies with respect to any product or part number manufactured or sold by Fireye shall be limited exclusively to the right to replacement or repair as above provided. In no event shall Fireye be liable for consequential or special damages of any nature that may arise in connection with such product or part.

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BD-5001
MAY 24, 2005

A Kidde Company

PRODUCT GUIDE SPECIFICATION

FIREYE BurnerLogix FLAME SAFEGUARD BURNER MANAGEMENT

1. GENERAL

1.1 OVERVIEW

Each burner shall be equipped with a Micro-processor Based Burner Management Flame Safeguard Control System. The control shall provide: (1) automatic sequencing of the boiler system through prepurge, pilot trial for ignition (PTFI), main trial for ignition (MTFI), run (AUTO), and post purge. (2) flame proving and lockout on flame failure during PTFI, MTFI, and AUTO.

1.1.1 The control system shall be provided by Fireye or written approved equal.

1.2 CODES AND STANDARDS

1.2.1 The control shall be listed by Underwriters Laboratories in accordance with US and Canadian standards and Factory Mutual for its intended purposes.

1.2.2 The control shall be in compliance with ASME/CSD-1.

1.2.3 The control shall be in compliance with NFPA 85, Boiler and Combustion Systems Hazards code.

2. SYSTEM HARDWARE

2.1 FLAME SAFEGUARD CONTROL

Major functions of the boiler management system shall have the following capabilities to provide:

2.1.1 User selectable burner operating parameters such as purge time, PTFI & MTFI time, post purge time, and specific operation of the various interlocks.

2.1.2 All burner operating parameters become permanent after 8 hours of main burner on time.

2.1.3 An adaptive Infrared flame scanning detection system where the characteristics of the pilot and main flames are separately learned in order to set the on/off thresholds and optimizing safety.

2.1.4 Flame proving and lockout on flame failure during PTFI, MTFI and AUTO.

2.1.5 The control shall have a non-volatile memory which allows it to remember burner history and present position, even after a power interruption.

2.1.6 The control shall provide a check-run switch to allow a qualified service technician to halt the burner sequence in any of five different positions:

- High fire purge
- Low fire purge
- Pilot trial for ignition
- Main trial for ignition
- Low fire (burner on)

2.1.7 Alpha-numeric multi-line LCD or VFD display to continually indicate operating parameters as well as first out annunciation.

2.1.8 SMART light emitting diodes (LED's) to provide operating status as well as lockout code identification.

2.1.9 Damper motor high and low fire damper motor position proving.

2.1.10 Non-volatile lockout and history files with the last 10 lockouts readable through the optional display.

2.1.11 Field replaceable 10 amp fuse in the fuel valve and ignition circuit for short circuit protection.

2.1.12 The control system shall operate within the following limits:
- Temperature: -40°F to 140°F (-40°C to 60°C)
- Humidity: 0% to 85% Non-condensing
- Voltage: 120 VAC (+10%, -15%) 50/60 Hz
- Power Consumption: 20 VA maximum
- 2000 VA maximum connected load
- 0.5G continuous vibration

2.1.13 The control shall have the following storage temperature limits:
- Temperature: -40°F to 158°F (-40°C to 70°C)
- Humidity: 0% to 85% Non-condensing

2.2 DISPLAY MODULE

The Display Module shall consist of a two (2) line with sixteen (16) characters per line liquid crystal (LCD) or vacuum fluorescent (VFD) display and multi-functional 4-key, positive action keypad.

2.2.1 The display module will provide the user the option of displaying messages in one (1) of six (6) languages.

2.2.2 The messages shall be clear, concise information concerning system timing, present burner sequence position, lockout causes (including wiring base terminal designations) and historical data.

2.2.3 During the firing cycle, a constant read-out of the flame signal will be displayed.

2.2.4 The Display Module shall incorporate a four (4) key keypad to allow the user direct local access to the following information:
- Number of burner operating cycles.
- Number of burner lockouts.
- Number of system hours.
- Reason for the last ten lockout along with the burner cycle and burner hour when the lockout occurred.
- Average pilot and main flame signal strength.
- Status of high fire and low fire end switches.

2.2.5 The LCD keypad/display module shall operate within the following temperature limits: -4°F to 140°F (-20°C to 60°C).

2.2.6 The VFD keypad/display module shall operate within the following temperature limits: -40°F to 140°F (-40C to 60°C).

2.2.7 The keypad/display module shall have the capability to be remotely mounted to a distance of 8 feet (2.43 meters).

2.2.8 When remotely mounted, both the LCD and VFD display modules shall provide NEMA 4 protection.

2.3 WIRING BASE

A pre-wired or terminal block wiring base shall be provided which will allow for all system terminations to be completely wired prior to the installation of the control. The control shall be removable or replaceable without removing any wiring terminations.

2.3.1 The wiring base shall provide line voltage terminal inputs from direct connection of limit and operating controls, fuel valve interlock, damper position interlocks, running interlocks (such as air flow, gas pressure, oil pressure, oil temperature), burner motor, ignition, pilot valves, main fuel valves, firing rate motor, and alarm.

2.3.2 The pre-wired wiring base shall be provided with 4 foot leads sufficiently sized to carry the load currents and each wired is labeled in accordance with its function.

2.3.3 The terminal block wiring base shall allow the user to measure the voltages and signals on any of the terminals without having to remove the control from the wiring base.

3. SYSTEM SOFTWARE

3.1 PROGRAMMER PARAMETERS

The control shall provide to the user a range of keypad selectable operational parameters that will allow the control to be properly suited to meet the application requirement. These parameters shall include purge time, PTFI/MTFI timings, post purge time, terminal 6 operation, M-8 prove open, M-D prove open, 3-P prove open, prove M-D during TFI, baud rate and unit address.

3.1.1 User programmable safety parameters become permanent after 8 hours of main burner operation.

3.2 SEQUENCE OF OPERATION

The control shall accomplish a safe start component

check during each start. This shall prevent the burner from firing under any condition which causes the flame relay to assume and hold its energized position due to the presence of an actual flame, a flame simulating component failure or mechanical failure.

3.2.1 A purge period of not less than 30 seconds with a damper driven to the open position and an interlock circuit provided to prove air flow rate during the purge period. A starting interlock circuit is required to prove that the burner equipment is in the low fire position at

the time of ignition, plus an interlock to prove air flow during the purge and firing cycle.

3.2.2 Limited trial-for-ignition of pilot flame restricted to 10 seconds, trial-for-main flame restricted to 10 or 15 seconds (selectable) for oil or gas.

3.2.3 Safety shutdown following flame failure, with fuel and ignition circuits de-energized in not more than 4 seconds.

3.2.4 A post purge of 15 seconds following a shutdown.

3.2.5 The system shall recycle automatically under control of the operating control and when power is restored following a power failure. Manual reset shall be required following any safety lockout, even after a power failure. When in a lockout condition, power interruptions will not recycle the control.

3.2.6 The control shall provide a check-run switch which shall allow a qualified service technician to halt the burner sequence in any of four different positions:

- High fire purge
- Low fire purge
- Pilot trial for ignition
- Main trial for ignition
- Low fire (burner on)

3.3 SAFETY PROVISIONS

A self diagnostic circuit within the control will identify module failures and an appropriate message will be displayed for servicing. This circuit will cause a safety shutdown should any component in the control fail. For example, if the chassis section is malfunctioning, the Display module will display the message "LOCKOUT CHECK CHASSIS"

3.3.1 The control will continually test the status of all safety critical loads (ignition transformer, pilot fuel valve, main fuel valve) to insure they are operating properly.

4. ANNUNCIATION AND DIAGNOSTICS

4.1 First out annunciation with burner sequence position indication.

4.2 Indication of failures at start up or during normal sequence operation.

4.3 Test itself for failure, detect and isolate an alarm, and report internal circuit faults.

4.4 Multiple language text description of system fault.

4.5 Maintain the last 10 faults with burner hour and burner cycle stamp in historical memory, accessible through the display or remote communications.

5. REMOTE COMMUNICATIONS

5.1 The burner management system shall operate either as an independent stand alone control, or as part of a distributed system network. In a distributed system network, multiple controllers are connected via a data link (a single twisted shielded pair wire) to a Supervisory Master Controller (eg: personal computer, PLC, building management system).

5.2 Up to 31 burner management controls can be connected together in a multi-drop configuration on a single data link.

5.3 The communication protocol for the distributed system network shall be MODBUS-RTU.

5.4 The distributed network shall offer selectable baud rates, 4800, 9600 or 19200 bits per second.

6. WIRING

6.1 All wiring shall be in accordance with National Electrical Code and local electrical codes.

6.2 The installing contractor shall be responsible for insuring that the conduit size and wire size, type and quantities are applicable for the installation and equipment supplied.

7. PRODUCT INFORMATION

Part Number	Description:
YB110**	Flame Safeguard Chassis and Amplifier type. (Specify IR for AutoCheck Infrared, UV for non self-check UV, UVSC for self-check UV).
YP1**	Programmer Module for Flame Safeguard Control. (Specify YP100, YP102, YP138 or YP113 to meet application requirements).
60-2810-1	Pre-wired wiring base for Flame Safeguard Control (surface mounted - UL listed).
60-2812-1	Closed Terminal block wiring base for Flame Safeguard Control (cabinet mounted - UL recognized).
60-2814-1	Open Terminal block wiring base for Flame Safeguard Control (cabinet mounted - UL recognized).
BLL510	LCD Keypad/Display Module.
BLV512	VFD Keypad/Display Module.
48PT2	Infrared scanner
UV1A	Ultra-violet (UV) scanner, non-self-check
45UV5-1009	Ultra-violet (UV) scanner, self-check
55UV5-1009	Ultra-violet (UV) scanner, self-check for hazardous locations

YP100, YP102, YP113
YP115,YP118, YP138
YP183,YP200, YP202
YP300, YP302

PROGRAMMER MODULES FOR USE WITH THE FIREYE®

BurnerLogix™ CONTROL SYSTEM

CE c UL us LISTED FM APPROVED

DESCRIPTION

The Fireye YP100, YP102, YP113, YP115, YP118, YP183, YP200, YP300, YP302 and YP138 Programmer Modules are used with the Fireye BurnerLogix control. The operational characteristics of the control are determined by the selection of the programmer module (e.g. modulation, recycle, non-recycle, fixed firing, flame failure response time, etc.). The programmer module incorporates a plug-in design for easy installation.

A complete BurnerLogix system includes the YB110 (YB230) or ZB110 (ZB230) chassis equipped with the type of flame amplifier required for the application, appropriate flame detector, plug-in programmer module, wiring base and optional alpha-numeric display. Interchangeable programmer modules allow for complete versatility in selection of function, timing and flame failure response times

.

WARNING: THE INAPPROPRIATE SELECTION OR APPLICATION OF A PROGRAMMER MODULE COULD RESULT IN AN UNSAFE CONDITION HAZARDOUS TO LIFE AND PROPERTY. The various programmer modules are interchangeable because they plug into a common YB chassis. Many parameters are configurable through the keypad display. Care should be taken to insure the proper parameters are set. Refer to bulletin BL-1001 or BLZ-1001 for a complete description of the BurnerLogix system. Selection of the programmer module and setting the various parameters for a particular application should be made by a competent professional, such as a Boiler/Burner technician licensed by a state or government agency, engineering personnel of the burner, boiler or furnace manufacturer (OEM) or in the performance of duties based on the information from the OEM.

PROGRAMMER MODULE SELECTION

YP100	Keypad selectable parameters, non-recycle operation, modulation, open damper proving, 4 second FFRT
YP102	Keypad selectable parameters, non-recycle operation, modulation, open damper proving, 2 second FFRT
YP138	Keypad selectable parameters, non-recycle operation, modulation, open damper proving, indefinite pilot hold, revert to pilot from auto, 4 second FFRT
YP118	Keypad selectable parameters, non-recycle operation, modulation, open damper proving, indefinite pilot hold, revert to pilot from auto, 1 second FFRT
YP183	Same as YP138, terminal W used for purge complete, no voltage on 21 to move to pilot, no voltage on 16 to move to main.
YP200	Keypad selectable parameters, recycle operation, modulation, 4 second FFRT
YP202	Keypad selectable parameters, recycle operation, modulation, 2 second FFRT
YP300	Keypad selectable parameters, recycle operation, low fire start, early spark termination, 4 second FFRT
YP302	Keypad selectable parameters, recycle operation, low fire start, early spark termination, 2 second FFRT
YP113	Keypad selectable parameters, non-recycle operation, modulation, open damper proving, 1 second FFRT
YP115	Keypad selectable parameters, non-recycle operation, modulation, open damper proving, 1 second FFRT

CAUTION: Ensure that electric power is turned off.

Be aware that power to some interlocks (operating controls, air flow switches, modulating circuits, etc.) may be derived from sources other than what is controlling the BurnerLogix.

INSTALLING THE YP PROGRAMMER MODULE

The YP programmer module plugs into the side of the YB110 (YB230) or ZB110 (ZB230) chassis modules and can only be installed in one direction. DO NOT ATTEMPT TO FORCE THE YP PROGRAMMER INTO THE CHASSIS. Referring to the illustration on the right, align the holes in the YP programmer housing with the posts located within the YB chassis. Push the YP module into the chassis until the YP module is flush with the YB housing.

If it is necessary to remove the YP programmer module from the YB chassis, 2 slots are provided on the top and bottom of the YP housing. A small screwdriver can be used to 'pop' the programmer from the chassis.

WARNING: Selection of this control for a particular application should be made by a competent professional, licensed by a state or other government agency. Inappropriate application of this product could result in an unsafe condition hazardous to life and property. Installation should not be considered complete until pilot turndown and other appropriate performance tests have been successfully completed.

FIREYE PART NUMBER	Pre-purge Programming (Seconds)	Proven High Fire Interlock (M-8)	Proven Low Fire Interlock (M-D)	Terminal 6, Interrupted or Intermittent	Early Spark Termination	PTFI (5/6)	MTFI (5/6)	Running Interlock (3-P)	Flame Fail Time (Seconds)	Firing Rate Motor
SETTINGS SHOWN ARE FACTORY DEFAULT										
YP100	30	YES	YES	INTRP	NO	10/10	10/15	Non-recycle	4	YES
YP102	30	YES	YES	INTRP	NO	10/10	10/15	Non-recycle	2	YES

FIREYE PART NUMBER	Pre-purge Programming (Seconds)	Proven High Fire Interlock (M-8)	Proven Low Fire Interlock (M-D)	Terminal 6, Interrupted or Intermittent	Early Spark Termination	PTFI (5/6)	MTFI (5/6)	Running Interlock (3-P)	Flame Fail Time (Seconds)	Firing Rate Motor
YP138	30	YES	YES	INTRP	NO	10/10	10/15	Non-recycle	4	YES
YP118	30	YES	YES	INTRP	NO	10/10	10/15	Non-recycle	1	YES
YP183	30	YES	YES	INTRP	NO	10/10	10/15	Non-recycle	4	YES
YP113	30	YES	YES	INTRP	NO	5/5	3/5	Non-recycle	1	YES
YP115	30	YES	YES	INTRP	NO	5/5	3/5	Non-recycle	1	YES
YP200	30	NO	YES	INTRP	NO	10/10	10/15	Recycle	4	YES
YP202	30	NO	YES	INTRP	NO	10/10	10/15	Recycle	2	YES
YP300	30	NO	YES	INTMT	YES	10/10	10/ intmt	Recycle	4	NO
YP302	30	NO	YES	INTMT	YES	10/10	10/ intmt	Recycle	2	NO

PTFI*MTFI TIMINGS

The BurnerLogix system provides keypad selectable timings for both PTFI and MTFI. The selections offered can provide 5 or 10 second timing for terminal 5 and 6 or a shortened time for terminal 5, allowing for early spark termination. BurnerLogix also provides selectable interrupted or intermittent operation for terminal 6.

The selections provided for PTFI*MTFI timings are:

Table 2:

SELECTION	PTFI		MTFI		COMMENT
	Term 5	Term 6	Term 5	Term 6	
10/10*10/15	10	10	10	15	
5/5*0/10	5	5	0	10	NO SPARK DURING MTFI
5/5*0/5	5	5	0	5	NO SPARK DURING MTFI
5/5*10/15	5	5	10	15	SHORTENED PTFI
5/5*10/10	5	5	10	10	
5/10*0/15	5	10	0	15	EARLY SPARK TERMINATION
5/10*0/10	5	10	0	10	EARLY SPARK TERMINATION
10/10*0/10	10	10	0	10	NO SPARK DURING MTFI
10/10*0/5	10	10	0	5	NO SPARK DURING MTFI
10/10*10/10	10	10	10	10	

SETTING PROGRAMMER PARAMETERS

In order to change the factory default parameters stored in the programmer module an optional keypad/ display (BLV512 or BLL510) is required. All configurable parameters are stored within the PROGRAM SETUP sub-menu. The keypad/display module provides tactile feedback keys that are used to access the sub-menus inherent in the BurnerLogix system.

Modifiable parameters located in PROGRAM SETUP sub menu

Parameter	Factory Default	Range	Description
Purge time	00:30s	0:30s – 60:00m, 15 second increments. 0:10s-60:00m, YP113 0:00s-60:00m, YP115 (0:00s - 60:00m in YP3XX)	Applies to open damper purge time in YP1XX and YP2XX programmers and to low fire start time in YP3XX programmers
Count method	DOWN	UP, DOWN	Time counts UP to final value or DOWN to zero from starting value. This setting will apply to all timer values.
Prove 3-P open at start	NO	YES, NO	Prevents jumped terminals. Requires the 3-P circuit to be open at the start of a cycle.
PTFI*MTFI timing	10/10*10/15 YP113 = 5/5*3/5	**See Table 2**	Applies to terminals 5 and 6 operation during PTFI and MTFI.
Terminal 6 interrupted or intermittent	INTRP	INTRP, INTMT	Provide interrupted or intermittent operation on terminal 6.
Prove M-8 open	NO	YES, NO	If YES, M-8 must be open at start of open damper purge period. (YP1XX Series only).
Prove M-D open	NO	YES, NO	If YES, M-D must be open at end of open damper purge period. Does not apply to YP3XX Series.
Post purge	0:15	0:15s - 4:00m*, 5 second increments.	Selects Post Purge time * code 8 or above display required
3-P Recycle	YES	YES, NO	Applies to YP3XX series only. Allows non-recycle operation of 3-P circuit.
M-D WAIT 10m	YES	YES, NO	Select YES for lockout on M-D open for 10 minutes. Select NO for indefinite wait for M-D to close. This wait time applies prior to pilot trial for ignition.
PROVE M-D TFI	NO	YES, NO	Select YES to force lockout on M-D opening during PTFI and MTFI
Baud rate	9600	4800, 9600, 19200, 38400*	Sets communication baud rate, * code 8 or above display required
Unit address	00	00-31	Multi-drop requires unique addressing. Lowest address allowed for modbus is 01
Lock Settings	NO	YES, NO	Parameters can be stored to memory before automatic 8 hour store.

Note:Shaded parameters not affected by 8 hour burn-in or LOCK SETTINGS.

TO VIEW AND MODIFY A PROGRAMMABLE PARAMETER:

On display module BLV512 or BLL510, use the NEXT or BACK key to scroll to PROGRAM SETUP. Press the MODE key to enter the submenu showing all program setup parameters. Pressing the MODE key while in the sub-menu will exit the sub-menu, and the next main menu item will be displayed. While in the sub-menu, pressing the NEXT key will scroll forward through the sub-menu. Pressing the BACK key will scroll backward through the sub-menu. When a modifiable parameter is displayed, pressing the RESET/MDFY key will allow the displayed parameter to be modified. Use the NEXT or BACK keys to select the value to suit the application and when done, press the RESET/MDFY to save the value to memory.

All programmed settings become permanent if the BurnerLogix system has been powered continuously and 8 hours of main burner (terminal 7) on time has been accumulated. If the AC power is removed prior to accumulating 8 hours of main burner on time, the system burn-in time clock will be reset to zero. It is not necessary for the main burner on time to be continuous. The BurnerLogix accumulates burner on time in seconds. For example, assume power has been applied for 10 hours and the main burner has been on for 4 hours. If the AC power is removed and then restored the accumulated main burner on time will be reset to 0. If necessary, the programmed settings can be made to become permanent anytime before the required 8 hours of main burner on time through the use of the optional keypad and the LOCK SETTINGS option under the PROGRAM SETUP sub menu.

Refer to Bulletin BL-1001 or BLZ-1001 for complete information

NOTICE

When Fireye products are combined with equipment manufactured by others and/or integrated into systems designed or manufactured by others, the Fireye warranty, as stated in its General Terms and Conditions of Sale, pertains only to the Fireye products and not to any other equipment or to the combined system or its overall performance.

WARRANTIES

FIREYE guarantees for *one year from the date of installation or 18 months from date of manufacture* of its products to replace, or, at its option, to repair any product or part thereof (except lamps, electronic tubes and photocells) which is found defective in material or workmanship or which otherwise fails to conform to the description of the product on the face of its sales order. **THE FOREGOING IS IN LIEU OF ALL OTHER WARRANTIES AND FIREYE MAKES NO WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED.** Except as specifically stated in these general terms and conditions of sale, remedies with respect to any product or part number manufactured or sold by Fireye shall be limited exclusively to the right to replacement or repair as above provided. In no event shall Fireye be liable for consequential or special damages of any nature that may arise in connection with such product or part.

Energy
Consortium
Industries, Inc.
949 E. Mill St. / P.O. Box 271 / Bountiful UT 84010
Phone: 801-295-4404 / Fax: 801-295-4425
email: eciutah@q.com

GAS FILTER

3" MAIN GAS LINE: **FILTER FAB MANUFACTURING CORP.**

MODEL F3-180F

1" PILOT LINE: **AMERICAN METER**

MODEL FA16S CFR

FilterFab F-Series Filters Remove Dry Particulates from Gas Lines

All gas lines have dry contaminants (such as pipe scale, dirt, and rust) that will damage or even destroy your downstream equipment. Using a Filterfab F-Series Dry Filter will remove all forms of dry contamination, lengthening the life of your equipment and saving thousands of dollars in maintenance costs.

F-Series Dry Filters have:

- **4 different closure styles.** FilterFab has designed its lid closures to make filter element changeout as easy and as fast as possible. 2" thru 6" line sizes in 180 and 285 psi ratings use a quick-opening swing-bolt lid or blind flange, while larger and higher pressure filters incorporate a blind flange with lifting lug or a lifting davit. Optional threaded high-pressure closures are also available.
- **4 pressures (MAOP).** Available in 180, 285, 740 and 1480 psi.
- **7 standard line sizes.** Choose from 2" to 12". Custom sizes to 24" available.
- **A wide range of flowrates.** 5,000 to 25,000,000 scfh.
- **2 types of filter cartridges.** Our standard replaceable filter cartridge uses polyester-felted media or polyester/cellulose media, both of which remove 99.9% of all solid particles 10-microns and larger. This is well beyond the recommendations of all major manufacturers of meters and regulators. Our standard filter size is 10 microns, but filters with retention ratings as low as 0.3 micron to as high as 75 microns are available.

Call FilterFab's Sales Department for pricing and a representative in your area. Many model sizes are kept in stock for quick delivery.

FILTERS ALWAYS PAY FOR THEMSELVES

F-Series Dry Filter

F-Series Dry Filter with Threaded Knockoff Closure

CFR Filters

Elster American Meter CFR gas filters, including flanged, screwed and pilot filters effectively remove dirt, pipe scale and other matter from gas line in commercial and industrial applications.
Filter elements are made of rein impregnated cellulose fiber so that moisture will not impair their effectiveness.

FILTER FAB MANUFACTURING CORPORATION

Call FilterFab Toll-Free: 1-800-899-692

3709 Greengarden Road • Aliquippa, PA 15001 US
Phone 724-375-6927 • Fax 724-375-662
Email u

FilterFab F-Series Filters Remove Dry Particulates from Gas Lines

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- **7 standard line sizes.** Choose from 2" to 12". Custom sizes to 24" available.
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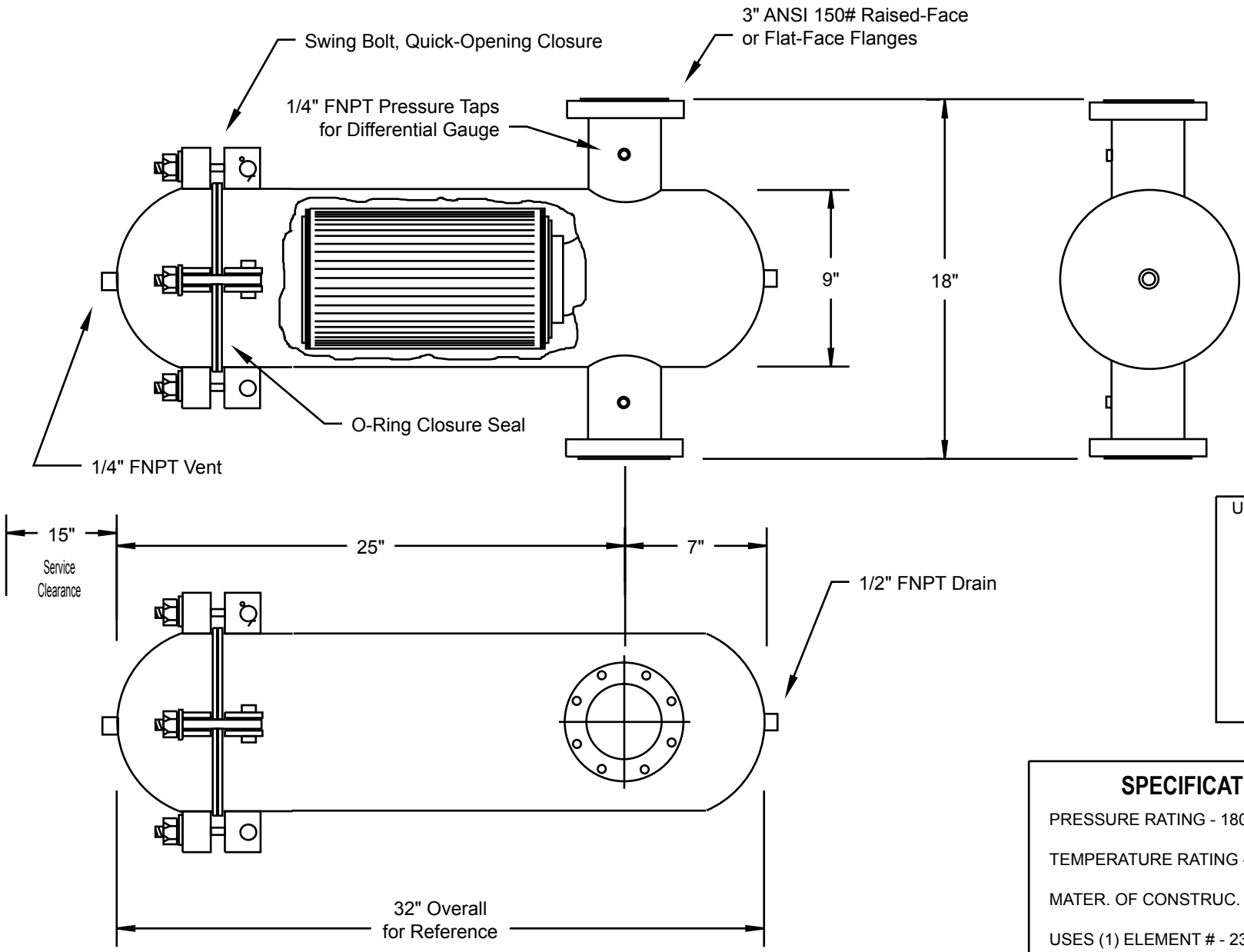
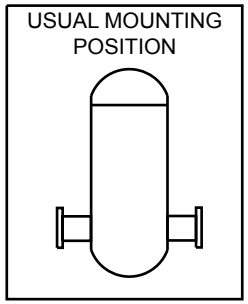
F-Series Dry Filter with Threaded Knockoff Closure





SPECIFICATIONS

PRESSURE RATING - 180 PSI

TEMPERATURE RATING - 100 F

MATER. OF CONSTRUC. - CARBON STEEL

USES (1) ELEMENT # - 2394K5

FilterFab

MANUFACTURING CORPORATION

MODEL F3-180F

elster
American Meter

Our products

- Gas Metering Products
- Gas Regulation Products
- Elster Gas Depot
  - Meter/Regulator Accessories
  - Gas Filtration Products
    - CFR Filters
    - Gasket Strainers
  - Gas Filter Parts Lists
  - Diaphragm Meter Parts Lists
  - Rotary Meter Parts Lists
  - Turbine Meter Parts Lists
  - Low Pressure Delivery Regulators
  - Medium Pressure Delivery Regulators (6 to 60 psig)
  - High Pressure Delivery Regulators
- Metrology
- Remanufacturing/Refurbishing Services

CFR Filters

Elster American Meter CFR gas filters, including flanged, screwed and pilot filters effectively remove dirt, pipe scale and other matter from gas line in commercial and industrial applications.
Filter elements are made of rein impregnated cellulose fiber so that moisture will not impair their effectiveness.

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OPERATION and MAINTENANCE

AMERICAN CFR screwed filters

CFR screwed filters are generally used for residential and commercial service to protect water heaters, ranges, furnaces and other appliances. They also protect the regulator, meter and service piping from contaminants. Screwed filters are made of cast iron with maximum working pressures of 160 psig and will remove particles down to 5 microns.

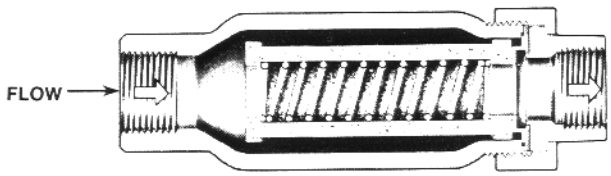
INSTALLATION

CAUTION: In designing the installation, enough room must be left to remove and replace filter elements.

MAINTENANCE

WARNING: Filters must be depressurized before any maintenance procedures are performed.

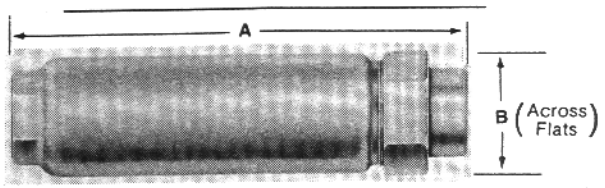
The pressure to collapse the filter element is approximately 25 PSID. Good engineering practice suggests replacing the element at half or less of the collapse differential. The elements are removed by disconnecting the filter body from the line.



CFR SCREWED TYPE FILTER

DIMENSIONS & WEIGHTS - Lbs.

Size	Lbs.	A	B
3/4	2	6"	1 15/16"
1	4	9"	2 5/16"
1 1/2	18 1/2	15"	3 7/8"
2	19	15"	3 7/8"



FILTER ELEMENT SPECIFICATION

Size	Size of Element	Number Required	Part Number 5 Micron
3/4"	1 1/4" x 3 5/8"	1	73355G001
1"	1 1/4" x 6 3/16"	1	73355G002
1 1/2"	2 1/2" x 11 5/32"	1	73355G004
2"	2 1/2" x 11 5/32"	1	73355G004

3/4" gasket ins 70019P090
(not ins. P011)
1" gasket 70019P015

Capacity Tables 0.6 Specific Gravity

Screwed Filter SCFH

Inlet Pressure PSIG	Differential Pressure							
	1" WC	2" WC	5" WC	10" WC	20" WC	1 PSI	3 PSI	5 PSI
	3/4" NPT							
.25	462	652	—	—	—	—	—	—
1	543	668	1050	1480	—	—	—	—
5	605	792	1180	1670	2330	2730	—	—
10	675	883	1320	1870	2620	3070	—	—
20	794	1040	1640	2220	3120	3660	6140	—
30	897	1170	1850	2520	3550	4160	7040	—
50	1070	1400	2200	3040	4280	5030	8570	10900
75	1250	1640	2580	3600	5050	5930	10200	13000
100	1410	1840	2900	4050	5650	6710	11500	14800
125	1550	2030	3190	4450	6210	7420	12800	16300
150	1680	2200	3450	4820	6720	8060	13900	17800
160	1730	2260	3550	4960	6910	8200	14500	18300
	1" NPT							
.25	543	766	—	—	—	—	—	—
1	640	785	1240	1740	—	—	—	—
5	713	933	1390	1960	2740	3200	—	—
10	795	1040	1560	2190	3080	3600	—	—
20	936	1230	1930	2600	3670	4300	7210	—
30	1060	1380	2180	2960	4170	4890	8280	—
50	1260	1650	2600	3570	5030	5900	10100	12800
75	1480	1930	3040	4240	5930	6970	11900	15200
100	1660	2170	3420	4770	6650	7890	13500	17300
125	1830	2390	3760	5240	7320	8710	15000	19200
150	1980	2590	4070	5680	7920	9470	16300	20900
160	2030	2660	4190	5840	8140	9900	17000	21500
	1-1/2" NP							
.25	2600	3670	—	—	—	—	—	—
1	3040	3760	5920	8340	—	—	—	—
5	3390	4430	6640	9360	13100	15300	—	—
10	3770	4940	7440	10500	14700	17300	—	—
20	4440	5810	9150	12500	17600	20600	34600	—
30	5020	6560	10300	14200	20000	23400	39600	—
50	5990	7840	12300	17100	24100	28300	48200	61200
75	7010	9170	14400	20100	28400	33400	57100	72900
100	7890	10300	16200	22600	31600	37800	64800	82900
125	8670	11300	17800	24900	34700	41700	71700	91900
150	9380	12300	19300	26900	37600	45300	78000	100000
160	9650	12600	19900	27700	38700	46000	81000	102000
	2" NPT							
.25	3350	4230	—	—	—	—	—	—
1	3910	4850	7640	10800	—	—	—	—
5	4370	5710	8560	12100	16900	19800	—	—
10	4870	6370	9590	13500	19000	22200	—	—
20	5730	7500	11800	16100	22600	26500	44500	—
30	6470	8460	13300	18300	25700	30200	51100	—
50	7720	10100	15900	22000	31000	36400	62100	78900
75	9040	11800	18600	25900	36600	43000	73600	93900
100	10200	13300	20900	29200	40700	48700	83600	107000
125	11200	14600	23000	32100	44800	53800	92400	119000
150	12100	15800	25000	34700	48400	58400	101000	129000
160	12400	16300	25600	35700	49800	60000	103000	132000

Screwed Filter SCMH

Inlet Pressure Bars	Differential Pressure (Line Taps)									
	1 MB	2 MB	5 MB	10 MB	20 MB	50 MB	100 MB	150 MB	250 MB	350 MB
	3/4" NPT									
.5	9	14	22	31	44	69	96	116	145	164
1	11	16	25	36	51	80	113	136	171	197
2	14	19	31	44	63	99	139	169	215	249
3	16	23	36	51	72	115	162	197	250	292
4	18	25	40	57	81	129	181	221	282	330
5	19	28	44	63	89	141	199	242	310	364
10	27	38	60	85	121	191	270	330	424	499
	1" NPT									
.5	11	16	26	37	52	81	114	137	170	193
1	13	19	30	42	60	94	133	160	201	231
2	16	23	37	52	74	117	164	199	252	293
3	19	27	42	60	85	135	190	231	294	344
4	21	30	47	67	95	151	213	259	331	388
5	23	33	52	74	105	166	233	285	364	427
10	31	45	71	101	142	225	317	388	498	587
	1-1/2" NPT									
.5	56	79	126	178	250	392	545	655	814	923
1	65	91	145	205	290	454	634	767	963	1110
2	79	113	178	252	355	559	784	952	1210	1400
3	91	130	206	291	411	647	909	1110	1410	1640
4	103	145	230	325	459	724	1020	1240	1590	1860
5	113	159	252	356	503	794	1120	1360	1740	2050
10	153	216	341	482	682	1080	1520	1860	2390	2810
	2" NPT									
.5	72	103	162	229	323	505	702	844	1050	1190
1	83	119	187	285	373	586	818	988	1240	1430
2	103	145	230	324	458	720	1010	1230	1560	1810
3	119	168	265	375	529	834	1170	1430	1820	2120
4	133	188	296	419	592	933	1310	1600	2040	2390
5	145	205	325	459	649	1020	1440	1760	2250	2640
10	197	278	440	622	879	1390	1960	2390	3070	3620

1 Bar = 100 kPa **1 MB (Millibar = 0.1 kPa)**

MAXITROL

Gas Appliance Regulators 210 Series

210D, 210E, 210G & 210J*

SPECIFICATIONS

Maximum Inlet Pressure: ..... 10 psi
Emergency Exposure Limits: ..... 25 psi
Ambient Temperature Limits: ..... - 40° to 200° F
Gases: Suitable for application in natural, manufactured, mixed gases, liquified petroleum gases or LP gas-air mixture piping systems.
Mounting: ..... upright only

Note: All Maxitrol gas appliance regulators should be installed and operated in accordance with Maxitrol's "Safety Warning" Bulletin.

*** Not CSA Approved**

DESCRIPTION

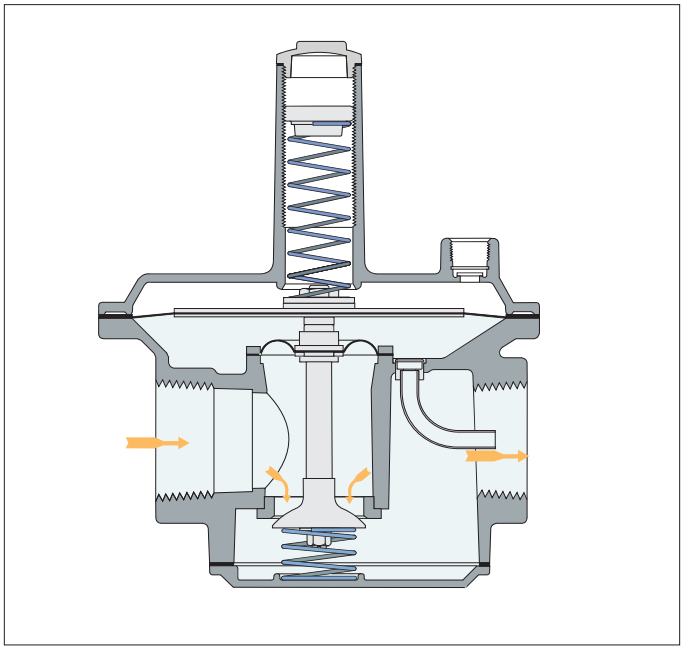
The 210 series is a lock-up type regulator and complies with codes using this specification.

The 210 series has been designed for maximum control function in an easy to use package. The series is intended for use with gas-fired boilers, steam generators, industrial furnaces, ovens, and similar high demand equipment.

The balanced valve design eliminates the inlet pressure effect acting on the valve. Regulating stability is improved and hunting tendencies reduced by the use of dampening mechanisms in both the breather outlet and sensing tube. You get precise regulation over a broad range of pressures and flow rates with the 210 series, including a "zero governor" application.

Housings are of high strength aluminum alloy and are reinforced with webs for maximum strength. The 210J model is of cast iron and steel construction with 125 pound flange connections. Internal parts are cast or machined from corrosion resistant metals or electroplated.
Diaphragms are of the finest synthetic coated fabrics.

When selecting pipe size, make sure regulator is not more than one size smaller or larger than manifold pipe size. Gas flow must be oriented to arrow on the bottom casting. At exposures to maximum emergency levels, the regulator will suffer no internal damage, but it may provide accurate regulation. See Maxitrol's "Spring Chart" for complete selection of spring ranges on all models.



Balanced Valve Design

Convenient tap locations are provided for downstream sensing, cross connections, and differential control. Four locations can be tapped and plugged for measuring pressure.

The 210D, E, and G may be ordered with remote sensing. The internal sensing tube is omitted and external sensing taps are provided. Add suffix letter "R" to model numbers when ordering.

Vertical vent tapped - 3/8" NPT on 210D, 1/2" on 210E, 3/4" on 210G and J.

The 210 series is designed to operate as a "zero governor" in the normal upright position - See Bulletin GPRZ-ER_MS_EN.

DIMENSIONS AND SPECIFICATIONS

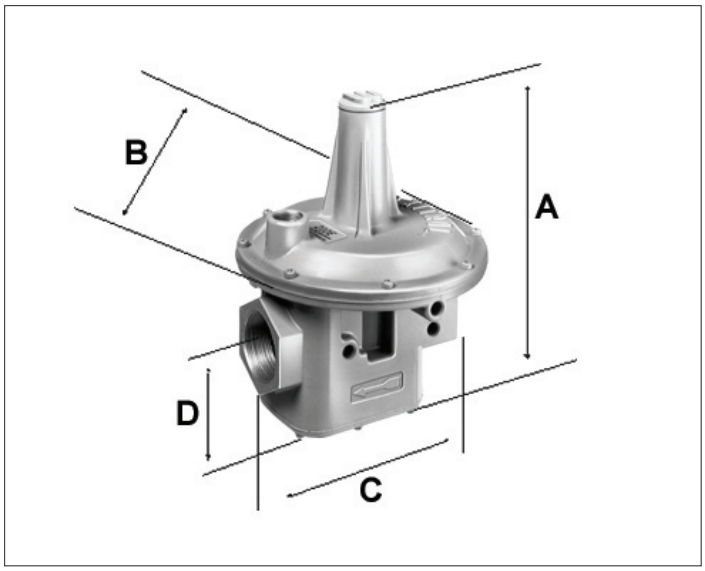


Illustration no. 1

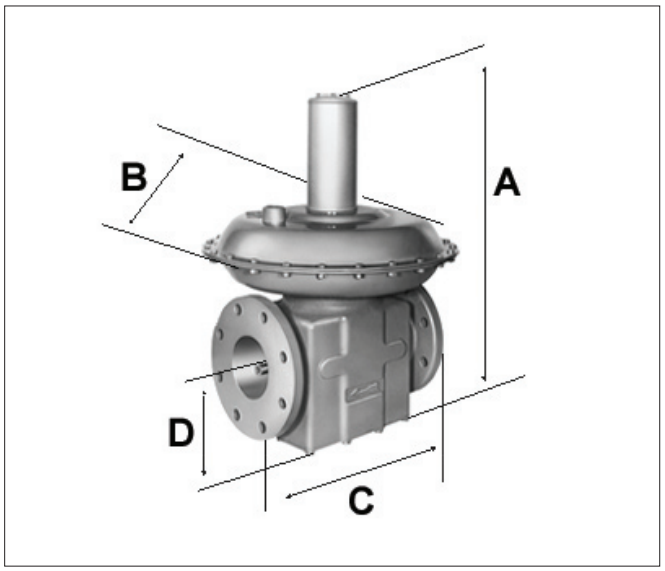


Illustration no. 2

DIMENSIONS - in inches

Model and Illustration Number		Swing Radius	Call Outs			
			A	B	C	D
210D	1	5 7/16	9	7	6	2 3/8
210E	1	8 5/16	11 1/4	9 1/8	8	2 15/16
210G	1	11 7/8	16 1/2	13 1/2	10 3/8	4 9/16
210J	2	18	24 1/4	18	13 3/4	5 7/16

NOTE: Dimensions are to be used only as an aid in designing clearance for the regulator. Actual production dimensions may vary somewhat from those shown.

SPRING SELECTION CHART - in inches

Model and Standard Spring Range		Other Springs Available									
210D	3.0” - 6.0”	1.0 - 3.5	2.0 - 5.0	3.0 - 8.0	4.0 - 8.0	4.0 - 8.0	4.0 - 12	5.0 - 12	10 - 22	15 - 30	20 - 42
210E	3.0” - 6.0”	1.0 - 3.5	2.0 - 5.0	3.0 - 8.0	4.0 - 8.0	4.0 - 8.0	4.0 - 12	5.0 - 12	10 - 22	15 - 30	20 - 42
210G	3.0” - 6.0”	1.0 - 3.5	2.0 - 5.0	3.0 - 8.0	4.0 - 8.0	4.0 - 8.0	4.0 - 12	5.0 - 12	10 - 22	15 - 30	20 - 42
210J	3.0” - 6.0”	---	2.0 - 5.0	3.0 - 8.0	---	4.0 - 8.0	4.0 - 12	---	10 - 22	15 - 30	20 - 42

CAPACITIES - expressed in ft^3/h@0.64 sp gr gas

Model Number and Pipe Size		0.1	0.3	0.5	1.0	3.0	5.0	7.0	1/2 psi	3/4 psi	1 psi	2 psi
210D	1 x 1	---	---	---	900	1600	2000	2400	3300	4100	4750	5800
	1 1/4 x 1 1/4	---	---	---	1100	1900	2500	2900	4100	5000	5850	7150
	1 1/2 x 1 1/2	---	---	---	1200	2100	2700	3200	4500	5500	6350	7750
210E	1 1/2 x 1 1/2	---	1050	1350	1915	3315	4280	5065	7125	8725	10075	12340
	2 x 2	---	1210	1560	2210	3825	4940	5845	8225	10070	11630	14245
210G	2 1/2 x 2 1/2	1410	2450	3160	4470	7740	9995	11825	16635	20375	23525	28810
	3 x 3	1555	2695	3475	4920	8520	11000	13020	18310	22425	25890	31710
210J	4 x 4	2700	4700	6000	8600	15000	19000	23000	32000	40000	45000	55700

MAXITROL

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BALANCED VALVE DESIGN

DESCRIPTION:
R & RS regulators are for main burner and pilot load applications. They are ideal for use in industrial applications such as infrared heaters and on pilot lines for large process heaters and bakers. They may also be used in residential applications as appliance regulators.

210 Series balanced valve design is a lockup-type regulator. Its intended applications include gas-fired boilers, steam generators, industrial furnaces, and ovens. Remote sensing option is available on 210D, E, and G models (consult Maxitrol).

MODELS & PIPE SIZES:

Models	Pipe Size
R400*	3/8", 1/2"
R400(F)	3/8", 1/2"
R400S*	3/8", 1/2"
R500*	1/2", 3/4"
R500S*	1/2", 3/4"
R600*	3/4", 1"
R600S*	3/4", 1"
210D*	1", 1 1/4", 1 1/2"
210E*	1 1/2", 2"
210G*	2 1/2", 3"
210J	4" Flanged

GASES:
Suitable for natural, manufactured, mixed gases, liquefied petroleum gases and LP gas-air mixtures.

Literature for Balanced Valve Regulators

* Product(s) has been tested and approved by Maxitrol Company.

Mertik Website | Pugi Website | Zps Website