



Shae Enterprises Inc.
P.O. Box 6174 Hickory, NC 28603
Terry Wilson
Phone 828-851-1843

Customer :

Project :
Quote No. : US-5181-1553
Page No : 1
Contact :
Phone :
Date : Monday, July 2, 2018
Fax :

Item: 1	Flow (US gpm)	Head (psi)	Eff. (%)	Power (hp)	Speed (RPM)
Model : Peerless - 8AEF20	2000	155	78.1	236.4	1780
	Liquid	Temp. (°F)	Sp. Gravity	Visc. (cSt)	Dia. (inch)
	Water	68	1.000	1.007	19.25

Summary Quotation:

Item No	Description	Weight (lb)	Qty
1	8AEF20 - Bronze Fitted, Pkd UL-FM Listed	1330	1
2	CI Casing with 125lb Suct/250lb Disch FF ANSI flanges	0	1
3	Hardware & Split Flange Gasket for 125lb/250lb ANSI Csg	0	1
4	Bronze Impeller with Integral Rings	0	1
5	Bronze Casing Rings	0	2
6	Standard Grease Lube Bearings	0	1
7	RH Steel Shaft Single Row Outboard Bearing	0	1
8	Single Row Outboard/Inboard Brgs with Std Lip Seals	0	1
9	304 SS Shaft Sleeves (set of 2)	0	1
10	Standard Packing Suction Pressure < 100 Psi	0	1
11	UL-FM Lantern Ring with Seal Piping Std or High Pressure Pkg	0	1
12	UL Listed/FM Approved Fire Pump Nameplate US	0	1
13	US H I Std NW Perf Test Included in Pump Price	0	1
14	US H I Non-Witness Hydrostatic Test Included in Pump Price	0	1
15	, Risers & Hardware Only, Factory	0	1
16	JU6H UFADW8 282Bhp/1760Rpm 230V 50/60H Htr NSPS Tier 3, Diesel Engine UL/FM/ULC 12V NG, Clarke CW Rotation Only	2551	1
17	Non Drip Rim Base	0	0
18	Standard engine cooling water loop is suitable for water temperature up 100 Degrees F. (37.78 C.). If exceeded refer to Clarke Fire website for cooling water piping size calculator to see if optional larger cooling loop is required	0	0
19	Minimum Inlet Pressure is 80 Psig @ 150% of Pump Rated flow, Pressure Regulator set at 60 psig and 10 psig discharge pressure. If less than minimum required inlet pressure, refer to Clarke Fire (www.clarkefire.com) for Cooling Loop Online Calculator.	0	0



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20	Standard 1" w/ 1 1/4" Regulator HSC/ES FM Engine Cooling Loop Galv Stl Piping Included in Engine Price	0	1						
21	Combination Flex Shaft FlyWheel Cover Guard, Fuel Lines, Flexible Exhaust Connector (Included in Engine price)	0	0						
22	Lead Acid Batteries (Dry)	0	0						
23	UL Listed Flexible Drive Shaft and Guard Furnished	0	0						
24	Mark II XG LA Batts UL/ULC/FM, FP Diesel Controller 12 VDC, Firetrol Clarke JU, JW Electronic	200	1						
25	NEMA Type 2 Enclosure Standard	0	1						
26	0 300 psi (0 20.7 bars) wet parts for fresh water applications	0	1						
27	110 120 VAC 1 Ph 60 Hz Operation	0	1						
28	Low fuel level switch furnished by others	0	1						
29	Wall Mounting (Standard)	0	1						
30	15 300Psi Suct 0 600Psi Disc, Suction and Discharge Gauges, Factory	6	1						
31	6x10 125 Lb ANSI Flg Cl, Enclosed Over Flow Cone, Factory	136	1						
32	8" x 300# Grooved Inlet D.I., Hose Valve Head, Factory	125	1						
33	10x8 300 Lb R F ANSI Flg Fab Stl, Concentric Discharge Reducer, Factory	210	1						
34	2.5NPT Natl Std, Angle Hose Valves w/Caps&Chns, Factory	84	6						
35	350 Gal E, 1/8, 1/4, 3/8, 1/2, 5/8, 3/4, 7/8, Full Scale, Tank Direct Reading Fuel Gauge, Factory Choice	5	1						
36	For Double Wall Fuel Tanks, Leak Sensing Float Switch, Flotronix FLO L10785	5	1						
37	Diesel Fuel System w/Std Vent, For UL Labld Dble Wall Tank, Factory	0	1						
38	1/2 In, 300 Psi Max FM , Automatic Air Release Valve, Factory Choice	9	1						
39	6 in 100 300 Psi Range UL/FM, Pilot Oper Rel Val 250x125 Lb, Cla Val 2050B 4KG	295	1						
40	CR 3 15 3Hp 182TCFr 3Ph 208 230/460V, Jockey Pump w/TEFC Motor, Grundfos	99	1						
41	Cast Iron Base w/ 1 inch Oval Suction/Discharge Flange	0	0						
42	3Hp 460V/3Ph/60Hz, FTA550F Manual Motor Protector, Firetrol Jockey Control	15	1						
43	NEMA 2/12 (IEC IP22/IP54) Polycarbonate Enclosure	0	1						
44	Door Mounted Graphical Display/User Interface/Pressure Display	0	1						
45	Hand OFF Auto Switch	0	1						
46	Minimum run timer	0	1						
47	On Delay Timer	0	1						



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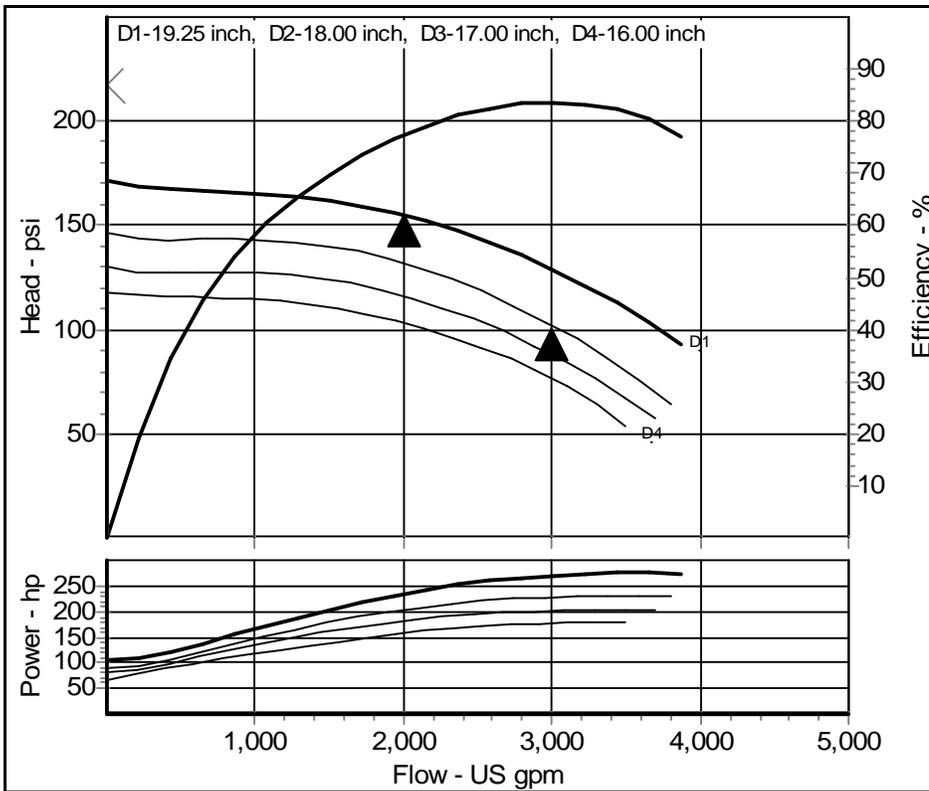
Project :
 Quote No. : US-5181-1553

Page No : 4

Contact :
 Phone :
 Date : Monday, July 2, 2018
 Fax :

Type: **AEF - Horizontal Split Case Single Stage Fire**
 Pump Model: **Peerless - 8AEF20**
 Nom. Speed: **1780 RPM, Diesel**
 Impeller Dia.: **19.25** inch
 Curve No.: **3136082**
 Market : **FM/UL/ULC Listed Fire Pump**

Item : **1**
 Impeller No.: 2693333
 Fluid: **Water**
 Temperature: **68** °F
 Viscosity: **1.007** cSt
 Sp. Gravity: **1.000**
 Your Ref. :



Rated Flow	2000 US gpm
Rated Head	155 psi
Imp. Dia.	19.25 inch
Rated Power Required	234.3 hp
Rated Efficiency	77.3 %

NFPA Limits:	
140% Head at shutoff	217.1 psi
65% Head at 150% flow	100.8 psi
Flow at 150%	3000 US gpm
Head at 150%	129.2 psi
Power Req. at 150%	270.5 hp
Efficiency at 150%	83.7 %
Peak Power	275.8 hp
Closed Valve Head	171.2 psi
Approval/Listing	FM/UL
<input checked="" type="checkbox"/> Add 2% Engine Cooling	

Comments
 Performance curve represents typical performance. NPSH data is

Flow (US gpm)	Head (psi)	Efficiency (%)	Power Required (hp)	NPSH Required (ft)
0.0	171.2	0.0	104.8	
484.1	167.4	37.6	125.9	
968.2	165.5	57.5	162.5	
1452.4	162.2	68.8	199.9	
1936.5	156.1	76.5	230.8	
2420.6	146.3	81.5	253.6	
2904.7	132.3	83.6	268.4	
3388.9	115.1	82.6	275.5	
3873.0	93.2	77.2	272.9	



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Item: 1
 Model : Peerless - 8AEF20

Flow (US gpm)	Head (psi)	Eff. (%)	Power (hp)	Speed (RPM)
2000	155	78.1	236.39	1780
Liquid	Temp. (°F)	Sp. Gravity	Visc. (cSt)	Dia. (inch)
Water	68	1.000	1.007	19.25

Technical Information:

Technical Information: **8AEF20**

Casing Suction Design	Double
Casing Volute Design	Single
Nominal Casing Thickness Inches	0.69
Corrosion Allow Inches	0.12
Max Suct Press PSI Packed 125# Suct CI Csg	150
Max Suct Press PSI Packed 250# Suct CI Csg	Refer to Factory
Max Suct Press PSI Packed 250# Suct DI Csg	Refer to Factory
Max Work Press PSI Packed 125# Disch CI Csg	175
Max Work Press PSI Packed 250# Disch CI Csg	300
Max Work Press PSI Packed 250# Disch DI Csg	Not Available
Cutwater Diameter Inches	20.84
Number of Impeller Vanes	8
Minimum Impeller Diameter Inches	16
WR2 Lb-Ft2 Wet Bronze Impeller	22
Shaft Diameter Through Impeller Inches	2.5
Shaft Dia Through Coupling Inches	2.25
Stuffing Box Shaft Sleeve Diameter Inches	2.75
Stuffing Box Bore Inches	4
Stuffing Box Depth Inches	4.12
Stuffing Box Face Nearest Obstruction Along Shaft In	2.44
Stuffing Box Square Packing Inches	0.625
Stuffing Box Packing Rows without Lantern Ring	6
Stuffing Box Packing Rows with Lantern Ring	5
Stuffing Box Gland Bolt Circle	7.5



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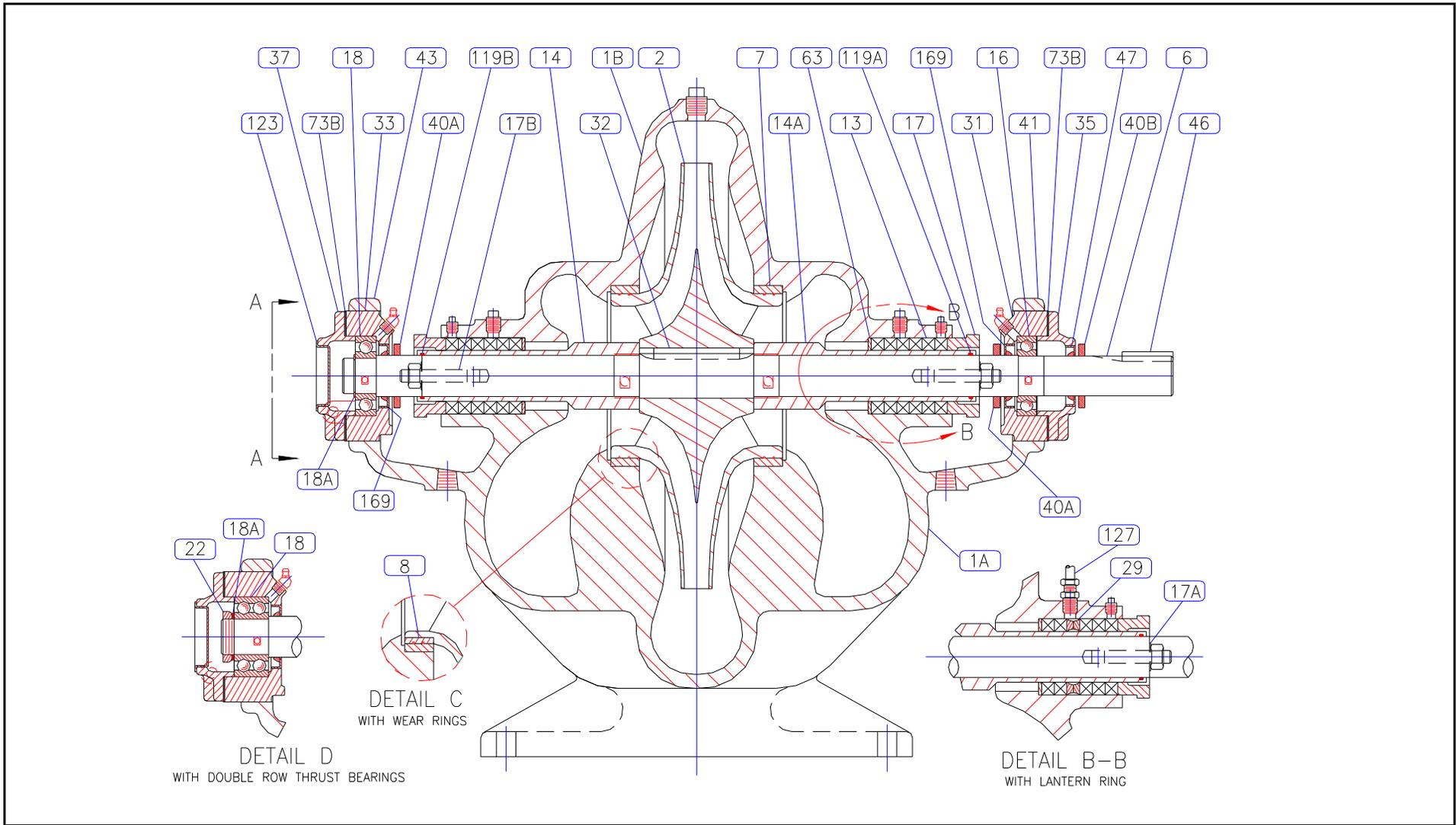
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Project :

Quote No. : US-5181-1553

Page No : 6

Stuffing Box Gland Bolt Dia Inches	0.625
Thrust Single Row Bearing Size	310
Radial Single Row Bearing Size	212
Thrust Double Row Bearing Size Optional	5310
First Critical Speed RPM	3649
Max Pump RPM Standard Construction	2100
Priming Connection NPT	1
Discharge Drain NPT	1
Suction Drain NPT	0.5
Rotor Series	5
Equivalent Commercial Model	8AE20



Project :	Capacity: 2000 (US gpm)	Frame/Model: JU6H-UFADW8
Customer:	Total Head: 155 (psi)	Elec. Spec.: DC/1 Ph. 12/230 V. 60 Hz
Item No.: 1	Pump Speed: 1780 (RPM)	Service Factor: 1
Quote No. : US-5181-1553	Impeller Dia.: 19.25 (inch)	Rotation: Clockwise
Pump Model: Peerless - 8AEF20	Power: 282 (hp)	Enclosure/Type:



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Page No : 7

CAST IRON BRONZE FITTED

ITEM NUMBER	DESCRIPTION	MATERIAL
1A, 1B	UPPER AND LOWER CASING	CAST IRON
2	IMPELLER	BRONZE
6	PUMP SHAFT	STEEL ①
7	CASING RING	BRONZE
8	IMPELLER RING (OPTIONAL)	BRONZE
13	PACKING RING	GRAPHITED / PTFE
14	SHAFT SLEEVE (RH)	304 STAINLESS STEEL ①
14A	SHAFT SLEEVE (LH)	304 STAINLESS STEEL ①
16	INBOARD BALL BEARING	STEEL ASSEMBLY
17	PACKING GLAND	304 STAINLESS STEEL
17B	GLAND BOLT	STEEL
18	OUTBOARD BALL BEARING	STEEL ASSEMBLY
18A	BEARING RETAINING RING	STEEL
22	BEARING LOCKNUT	STEEL
29	LANTERN RING (OPTIONAL)	PTFE
31	INBOARD BEARING HOUSING	CAST IRON
32	IMPELLER KEY	STAINLESS STEEL
33	OUTBOARD BEARING HOUSING	CAST IRON
35	INBOARD BEARING HOUSING COVER	CAST IRON
37	OUTBOARD BEARING HOUSING COVER	CAST IRON
40A	INBOARD DEFLECTOR	RUBBER
40B	OUTBOARD DEFLECTOR	RUBBER
41	INBOARD BEARING HOUSING CAP	CAST IRON
43	OUTBOARD BEARING HOUSING CAP	CAST IRON
46	COUPLING KEY	STEEL
47	INBOARD BEARING COVER SEAL	STEEL/RUBBER ASSEMBLY
63	STUFFING BOX BUSHING	BRONZE
73A	CASING GASKET (NOT SHOWN)	VEGETABLE FIBER
73B	BEARING COVER GASKET	FIBER
77	LUBRICATOR	ZINC DIE-CAST/PLASTIC ASSEMBLY
119A	O RING, SHAFT SLEEVE	BUNA N RUBBER
119B	O RING, SHAFT SLEEVE	BUNA N RUBBER
123	BEARING END COVER	STEEL
127	WATER SEAL PIPING (OPTIONAL)	COPPER WITH BRASS FITTINGS
169	BEARING HOUSING SEAL	STEEL/RUBBER ASSEMBLY

① OPTIONAL MATERIAL AISI 416 STAINLESS STEEL

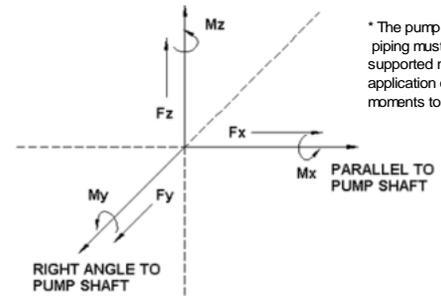


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Page No : 8

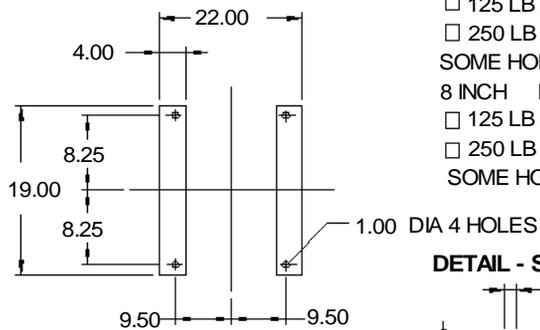
Project :	Capacity:	2000 (US gpm)	Frame/Model:	JU6H-UFADW8
Customer:	Total Head:	155 (psi)	Elec. Spec.:	DC/1 Ph. 12/230 V. 60 Hz
Item No.:	Pump Speed:	1780 (RPM)	Service Factor:	1
Quote No.:	Impeller Dia.:	19.25 (inch)	Rotation:	Clockwise
Pump Model:	Power:	282 (hp)	Enclosure/Type:	

NOZZLE LOADING MAXIMUM FORCES & MOMENTS*



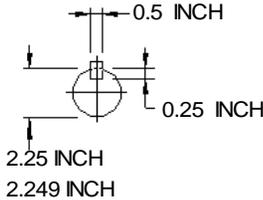
* The pump suction and discharge piping must be restrained and supported near the pump to avoid application of forces and moments to pump casing.

PLAN VIEW OF FEET

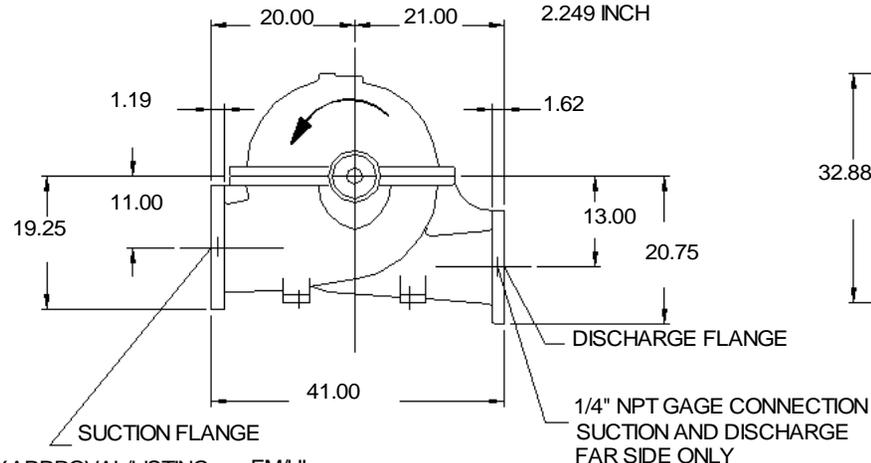


- 10 INCH SUCTION FLANGE
- 125 LB ANSI FLG DRILLING
 - 250 LB ANSI FLG DRILLING
- SOME HOLES MAYBE TAPPED
- 8 INCH DISCHARGE FLANGE
- 125 LB ANSI FLG DRILLING
 - 250 LB ANSI FLG DRILLING
- SOME HOLES MAYBE TAPPED

DETAIL - SHAFT END



PUMP FLANGE	UNITS	AXIS			UNITS	AXIS		
		F _x	F _y	F _z		M _x	M _y	M _z
SUCTION	Lb	930	2330	930	Lb-Ft	2500	5000	2500
DISCHARGE	Lb	800	2000	800	Lb-Ft	2000	4000	2000
SUCTION	N	4137	10364	4137	N-m	3390	6779	3390
DISCHARGE	N	3559	8896	3559	N-m	2712	5423	2712



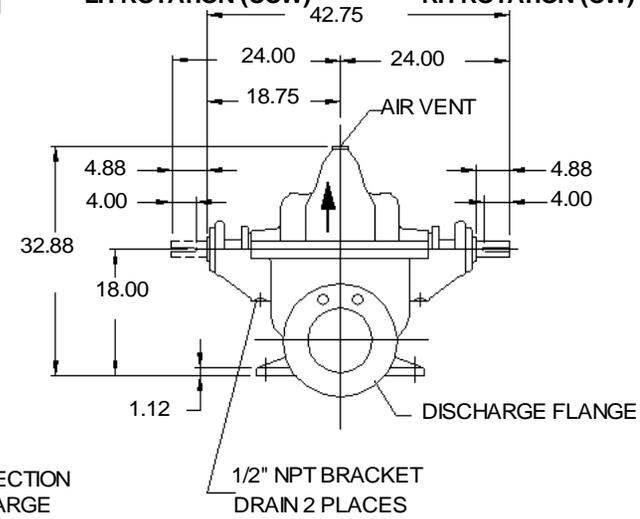
AGENCY APPROVAL/LISTING: FMUL

A-A VIEW FROM DRIVER END

LH ROTATION (CCW)

A-A VIEW FROM DRIVER END

RH ROTATION (CW)



PUMP WT 1330 LB / 605 Kg

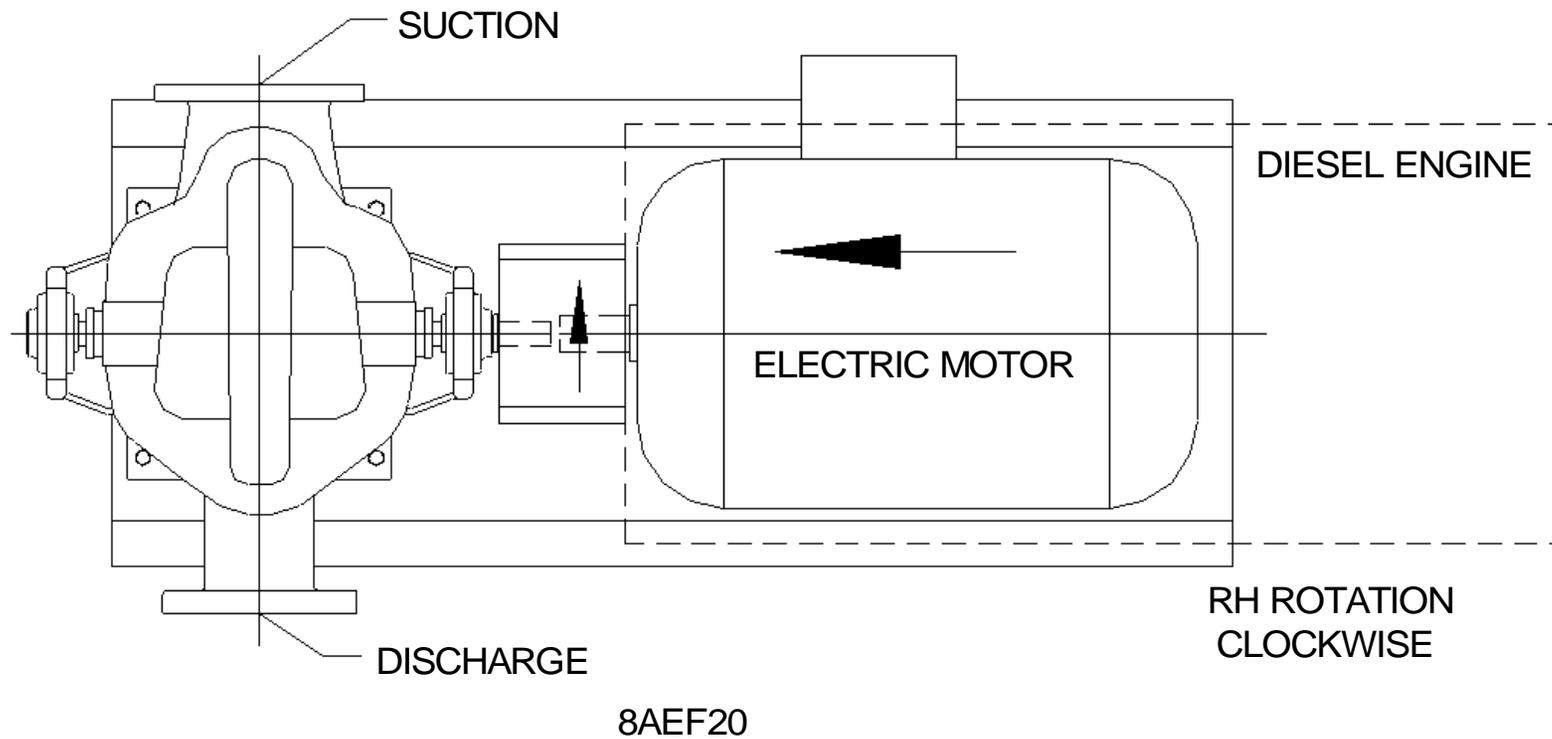
Dimensions in (inch)

Project :	Capacity: 2000 (US gpm)	Frame/Model: JU6H-UFADW8
Customer:	Total Head: 155 (psi)	Elec. Spec.: DC/1 Ph. 12/230 V. 60 Hz
Item No.: 1	Pump Speed: 1780 (RPM)	Service Factor: 1
Quote No. : US-5181-1553	Impeller Dia.: 19.25 (inch)	Rotation: Clockwise
Pump Model: Peerless - 8AEF20	Power: 282 (hp)	Enclosure/Type:



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Page No : 9



Dimensions in (inch)

Project :	Capacity: 2000 (US gpm)	Frame/Model: JU6H-UFADW8
Customer:	Total Head: 155 (psi)	Elec. Spec.: DC/1 Ph. 12/230 V. 60 Hz
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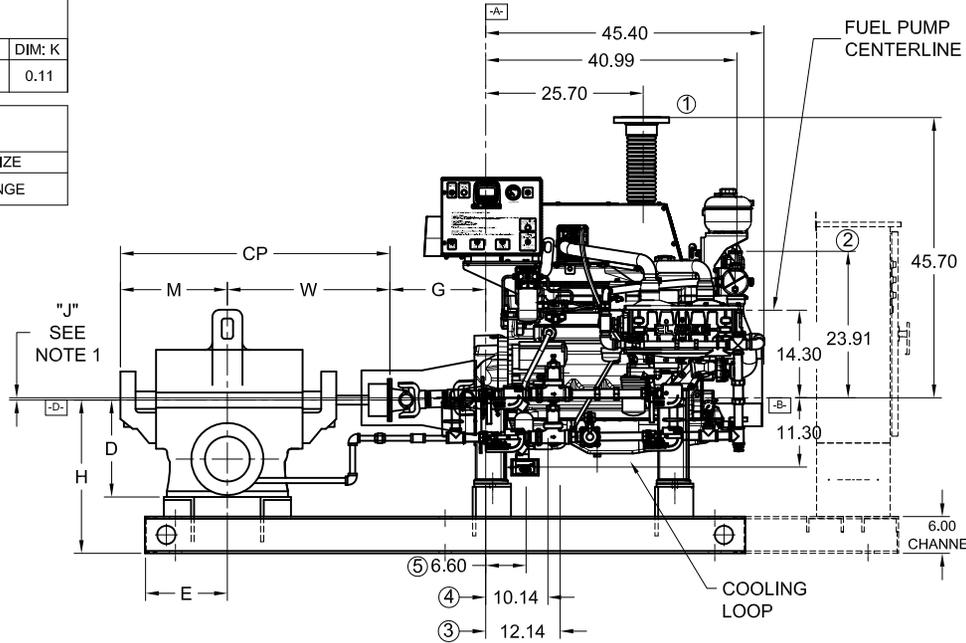
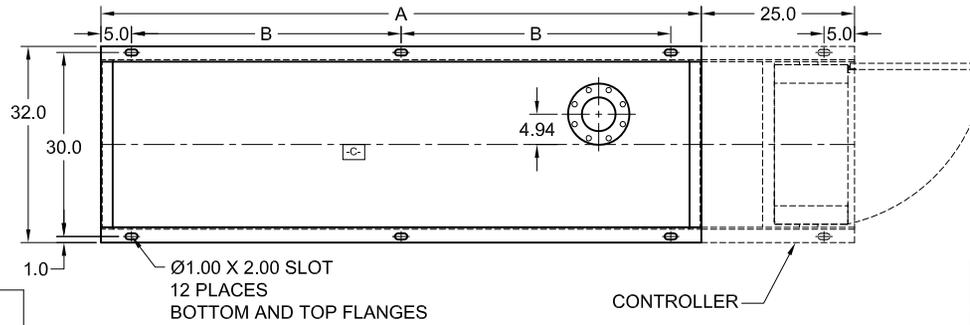
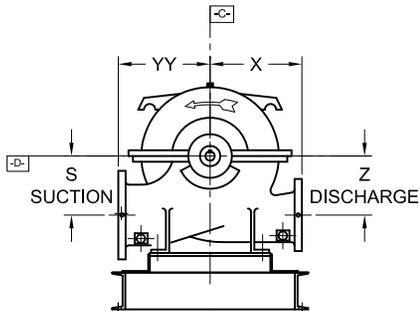
**CLARKE FIRE PUMP DRIVERS
EPA NSPS TIER 3 ENGINE MODELS
HSC APPLICATIONS**

- A- - MOUNTING FACE OF FLYWHEEL
- B- - ENGINE CRANKSHAFT HORIZONTAL CENTERLINE
- C- - ENGINE CRANKSHAFT VERTICAL CENTERLINE
- D- - PUMP SHAFT HORIZONTAL CENTERLINE

UL LISTED DRIVESHAFTS				
ENGINE MODEL	DRIVESHAFT MODEL	DIM: G	DIM: J	DIM: K
JU6H-UFADQ0, R0	CDS30-S1	15.75	0.35	0.10
JU6H-UFAD98, R8, S8, W8, X8	CDS50-SC	20.38	0.45	0.11

NON-LISTED DRIVESHAFTS				
ENGINE MODEL	DRIVESHAFT MODEL	DIM: G	DIM: J	DIM: K
JU6H-UFADP0, T0	CDS50-SC (SC81A) NON LISTED	20.38	0.45	0.11

EXHAUST OUTLET CONNECTION	
ENGINE MODEL	EXHAUST SIZE
JU6H-UFADQ0, P0, T0, R0, R8, S8, W8, X8, 98	6" 150# FLANGE



**Horizontal Split Case
AEF Pumps**

ITEM NO.	DESCRIPTION	CONNECTION SIZE
①	EXHAUST OUTLET CONNECTION	SEE EXHAUST LISTING
②	RAW WATER OUTLET	SEE NOTE 6.
③	FUEL SUPPLY CONNECTION	1/2" NPTF
④	FUEL RETURN CONNECTION	3/8" NPTF
⑤	HEATER JUNCTION BOX	VOLTAGE REQUIREMENTS: AC CONNECTION HEATER 1360 WATTS STD- 115 VAC ±5%-10% OPT- 230 VAC ±5%-10%

NOTES:

1. THE DRIVE SHAFT IS DESIGNED TO OPERATE AT A 2° ANGLE WITH THE INPUT AND OUTPUT SHAFTS IN PARALLEL. THE ENGINE CRANKSHAFT IS TO BE SET WITH A PARALLEL OFFSET OF "J" ± "K" INCHES VERTICALLY ABOVE THE PUMP SHAFT AND 0.00" ± "K" INCH PARALLEL OFFSET HORIZONTALLY RIGHT OR LEFT OF THE PUMP SHAFT. REFER TO THE CERTIFIED DRIVESHAFT INSTRUCTIONS MANUAL FOR ALIGNMENT INSTRUCTIONS.
2. BASE MUST BE COMPLETELY FILLED WITH GROUT PER NFPA 20.
3. PUMP IS CW (CLOCKWISE) ROTATION WHEN VIEWED FROM THE COUPLING END.
4. ALL DIMENSIONS ARE IN INCHES.
5. SUCTION AND DISCHARGE FLANGES DRILLED PER ANSI B16.1 (IF APPLICABLE).
6. RAW WATER OUTLET SIZE VARIES BASED UPON SITE CONDITIONS. DEFAULT SIZE: 1-1/4" NPT

PUMP TYPE	PUMP SIZE		DIMENSIONS											
	DISCH.	SUCT.	A	B	H	E	M	W	CP	D	YY	X	S	Z
5AEF14	5	6	88	39	19	12.75	13.50	17.25	30.75	13.00	13.00	14.00	7.00	8.50
6AEF14	6	8	98	44	24	22.50	13.75	17.50	31.25	15.00	16.00	14.50	9.00	9.50
6AEF16	6	8	98	44	24	21.25	15.00	18.75	33.75	15.00	16.00	18.00	9.12	10.75
6AEF17	6	8	98	44	24	21.25	15.00	18.75	33.75	15.00	16.00	18.00	9.12	10.75
6AEF18	6	8	98	44	24	20.25	15.50	19.75	35.25	15.00	16.00	17.00	9.00	10.50
8AEF15	8	10	98	44	24	21.00	14.75	19.00	33.75	16.00	17.69	16.00	9.00	10.00
8AEF17	8	10	98	44	24	20.25	15.50	19.75	35.25	18.00	19.00	15.00	10.00	12.00
8AEF20	8	10	98	44	24	16.00	18.75	24.00	42.75	18.00	20.00	21.00	11.00	13.00
10AEF16	10	12	98	44	24	16.00	18.75	24.00	42.75	18.00	21.00	16.50	11.00	12.00
10AEF20	10	12	108	49	30	25.50	20.50	26.00	46.50	19.50	22.00	23.00	11.00	14.00

Certified for: Approval Construction By: _____ Date: _____ Listed: UL FM

Project:	Capacity:	Engine Supplier: CLARKE
Customer:	Total Pressure:	Engine Model:
Item / P.O. No.:	Pump Speed:	Engine Preheater Voltage:
Quote No.:	Power:	Pump Serial No.:
Pump Model:	Rotation: CLOCKWISE (Right Hand)	SO No.:

JU6H-UFADMG
JU6H-UFAD58
JU6H-UFADNG
JU6H-UFADNO

JU6H-UFADP0
JU6H-UFADP8
JU6H-UFADQ0
JU6H-UFAD88

JU6H-UFADR0
JU6H-UFADR8
JU6H-UFADS8
JU6H-UFADS0

JU6H-UFADT0
JU6H-UFADW8
JU6H-UFADX8
JU6H-UFAD98

FM-UL-cUL APPROVED RATINGS BHP/KW

JU6H MODEL ◆	RATED SPEED								US-EPA (NSPS) Available Until ●
	1760		2100		2350		2400		
UFADMG			175	131	175	131			No Expiration
UFAD58	183	137							No Expiration
UFADNG	190	142	181	135	183	137	183	137	No Expiration
UFADNO	197	147	197	147	200	149	200	149	No Expiration
UFADP0			209	156	211	157	211	157	No Expiration
UFADP8	220	164							No Expiration
UFADQ0			224	167	226	169	226	169	No Expiration
UFAD88	237	177							No Expiration
UFADR0			238	177.5	240	179	240	179	No Expiration
UFADR8	250	187							No Expiration
UFADS8	260	194							No Expiration
UFADS0			260	194	268	200	268	200	No Expiration
UFADT0			274	204	275	205	275	205	No Expiration
UFADW8	282	211							No Expiration
UFADX8	305	227.5							No Expiration
UFAD98	315	235							No Expiration



Picture represents JU6H-TRWA Power Tech Plus Engine Series

● USA EPA (NSPS) Tier 3 Emissions Certified Off-Road (40 CFR Part 89) and NSPS Stationary (40 CFR Part 60 Sub Part III). Meet EU Stage IIIA emission levels.

◆ All Models available for Export

SPECIFICATIONS

ITEM	JU6H MODELS															
	MG	58	NG	N0	P8	88	P0	Q0	R0	S0	T0	R8	S8	W8	X8	98
Number of Cylinders	6															
Aspiration	TRWA															
Rotation*	CW															
Overall Dimensions – in. (mm)	59.8 (1519) H x 56.7 (1414) L x 36.7 (933) W								60.9 (1547) H x 58.6 (1488) L x 40.0 (1015) W							
Crankshaft Centerline Height – in. (mm)	14 (356)															
Weight – lb (kg)	1747 (791)															
Compression Ratio	19.0:1								17.0:1							
Displacement – cu. in. (L)	415 (6.8)															
Engine Type	4 Stroke Cycle – Inline Construction															
Bore & Stroke – in. (mm)	4.19 x 5.00 (106 x 127)															
Installation Drawing	D628															
Wiring Diagram AC	C07651															
Wiring Diagram DC	C071367, C072146, C071361								C071368, C072146, C071761							
Engine Series	John Deere 6068 Series Power Tech E								John Deere 6068 Series Power Tech Plus							
Speed Interpolation	N/A															

Abbreviations: CW – Clockwise TRWA – Turbocharged with Raw Water Aftercooling N/A - Not Available L – Length W – Width H - Height

*Rotation viewed from Heat Exchanger / Front of engine

CERTIFIED POWER RATING

- Each engine is factory tested to verify power and performance.
- FM-UL power ratings are shown at specific speeds, Clarke engines can be applied at a single rated RPM setting ± 50 RPM.



ENGINE RATINGS BASELINES

- Engines are to be used for stationary emergency standby fire pump service only. Engines are to be tested in accordance with NFPA 25.
- Engines are rated at standard SAE conditions of 29.61 in. (752.1 mm) Hg barometer and 77°F (25°C) inlet air temperature [approximates 300 ft. (91.4 m) above sea level] by the testing laboratory (see SAE Standard J 1349).
- A deduction of 3 percent from engine horsepower rating at standard SAE conditions shall be made for diesel engines for each 1000 ft. (305 m) altitude above 300 ft. (91.4 m)
- A deduction of 1 percent from engine horsepower rating as corrected to standard SAE conditions shall be made for diesel engines for every 10°F (5.6°C) above 77°F (25°C) ambient temperature.

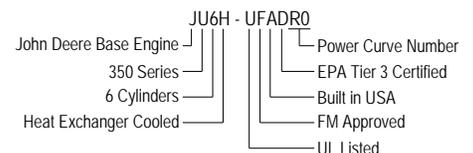
JU6H-UFADMG	JU6H-UFADP0	JU6H-UFADR0	JU6H-UFADT0
JU6H-UFAD58	JU6H-UFADP8	JU6H-UFADR8	JU6H-UFADW8
JU6H-UFADNG	JU6H-UFADQ0	JU6H-UFADS8	JU6H-UFADX8
JU6H-UFADN0	JU6H-UFAD88	JU6H-UFADS0	JU6H-UFAD98

ENGINE EQUIPMENT

EQUIPMENT	STANDARD	OPTIONAL
Air Cleaner	Direct Mounted, Washable, Indoor Service with Drip Shield	Disposable, Drip Proof, Indoor Service Outdoor Type, Single or Two Stage (Cyclonic)
Alarms	Overspeed Alarm & Shutdown, Low Oil Pressure, Low & High Coolant Temperature, Low Raw Water Flow, High Raw Water Temperature, Alternate ECM Warning, Fuel Injection Malfunction, ECM Warning and Failure with Automatic Switching	Low Coolant Level, Low Oil Level, Oil Filter Differential Pressure, Fuel Filter Differential Pressure, Air Filter Restriction
Alternator	12V-DC, 42 Amps with Poly-Vee Belt and Guard	24V-DC, 40 Amps with Poly-Vee Belt and Guard
Coupling	Bare Flywheel	UL Listed Driveshaft and Guard, JU6H-UFAD58/NG/ADMG/ADM8/K0/N0/Q0/R0-CDS30-S1; JU6H-UFADP8/P0/T0/88/R8/S8/S0/W8/X8/98- CDS50-SC at 1760/2100 RPM only
Electronic Control Module	12V-DC, Energized to Stop, Primary ECM always Powered on	24V-DC, Energized to Stop, Primary ECM always Powered on
Engine Heater	115V-AC, 1360 Watt	230V-AC, 1360 Watt
Exhaust Flex Connection	SS Flex, 150# ANSI Flanged Connection, 5" for JU6H-UFAD58/MG/NG/N0/P8/88; SS Flex, 150# ANSI Flanged Connection, 6" for JU6H-UFADP0/Q0/R0/S0/T0/R8/S8/W8/X8/98 (w/ orifice plate)	SS Flex, 150# ANSI Flanged Connection, 6" for JU6H-UFAD58/MG/NG/N0/P8/88; SS Flex, 150# ANSI Flanged Connection, 8" for JU6H-UFADP0/Q0/R0/S0/T0/R8/S8/W8/X8/98 (w/ orifice plate)
Exhaust Protection	Metal Guards on Manifolds and Turbocharger	
Flywheel Housing	SAE #3	
Flywheel Power Take Off	11.5" SAE Industrial Flywheel Connection	
Fuel Connections	Fire Resistant, Flexible, USA Coast Guard Approved, Supply and Return Lines	SS, Braided, cUL Listed, Supply and Return Lines
Fuel Filter	Primary Filter with Priming Pump	
Fuel Injection System	High Pressure Common Rail	
Governor, Speed	Dual Electronic Control Modules	
Heat Exchanger	Tube and Shell Type, 60 PSI (4 BAR), NPT(F) Connections – Sea Water Compatible	
Instrument Panel	Multimeter to Display English and Metric, Tachometer, Hourmeter, Water Temperature, Oil Pressure and One (1) Voltmeter with Toggle Switch, Front Opening	
Junction Box	Integral with Instrument Panel; For DC Wiring Interconnection to Engine Controller	
Lube Oil Cooler	Engine Water Cooled, Plate Type	
Lube Oil Filter	Full Flow with By-Pass Valve	
Lube Oil Pump	Gear Driven, Gear Type	
Manual Start Control	On Instrument Panel with Control Position Warning Light	
Overspeed Control	Electronic, Factory Set, Not Field Adjustable	
Raw Water Cooling Loop w/Alarms	Galvanized	Seawater, All 316SS, High Pressure
Raw Water Cooling Loop Solenoid Operation	Automatic from Fire Pump Controller and from Engine Instrument Panel (for Horizontal Fire Pump Applications)	Not Supplied (for Vertical Turbine Fire Pump Applications)
Run – Stop Control	On Instrument Panel with Control Position Warning Light	
Starters	Two (2) 12V-DC	Two (2) 24V-DC
Throttle Control	Adjustable Speed Control by Increase/Decrease Button, Tamper Proof in Instrument Panel	
Water Pump	Centrifugal Type, Poly-Vee Belt Drive with Guard	

Abbreviations: DC – Direct Current, AC – Alternating Current, SAE – Society of Automotive Engineers, NPT(F) – National Pipe Tapered Thread (Female), ANSI – American National Standards Institute, SS – Stainless Steel

MODEL NOMENCLATURE: (10 Digit Models)



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DO NOT SCALE

DATUMS:

- A- - MOUNTING FACE OF FLYWHEEL
- B- - ENGINE CRANKSHAFT HORIZONTAL CENTERLINE
- C- - ENGINE CRANKSHAFT VERTICAL CENTERLINE
- CENTER OF GRAVITY OF ENGINE
- CLOCKWISE ROTATION WHEN VIEWED FROM FRONT OF ENGINE

NOTE:
THE LOOP SHOWN IS BASED ON
STANDARD LOOP CONSTRUCTION AND
FM SIZING CONDITIONS

FOR ALTERNATE LOOP CONSTRUCTION
(STAINLESS STEEL, SEA WATER, AND
HIGH PRESSURE) SIZES MAY VARY

**DRAWING SUBJECT
TO CHANGE
WITHOUT NOTICE**

CAUTION:

ALL PLUMBING MUST BE SUPPORTED
AND/OR ISOLATED SO THAT NO WEIGHT
OR STRESS IS APPLIED TO ANY ENGINE COMPONENT

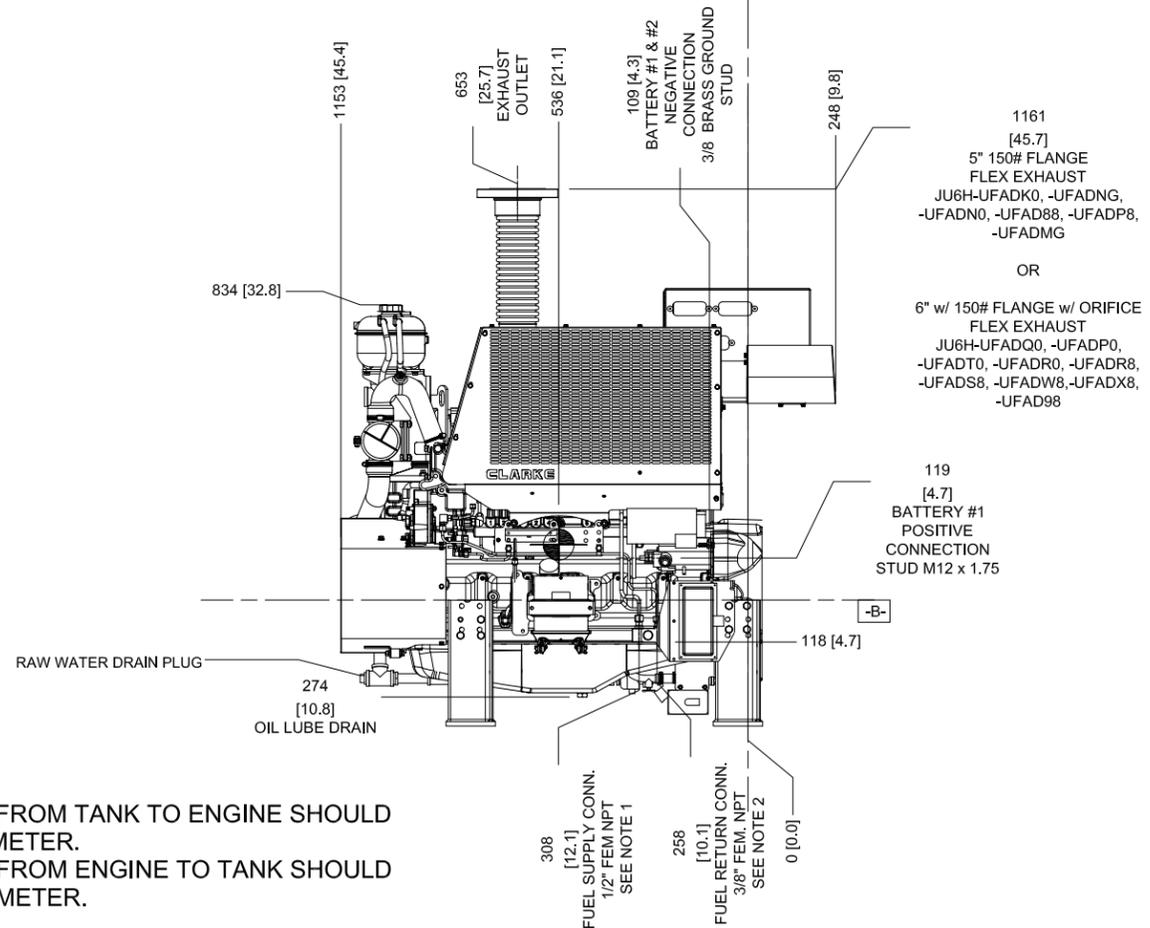
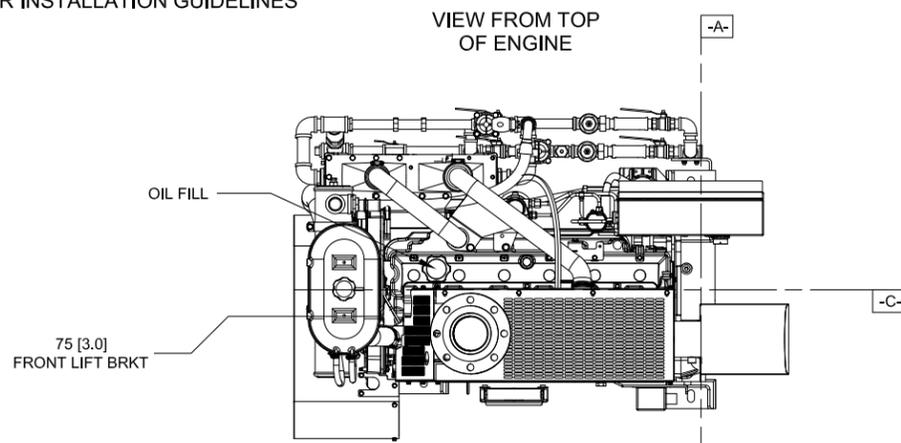
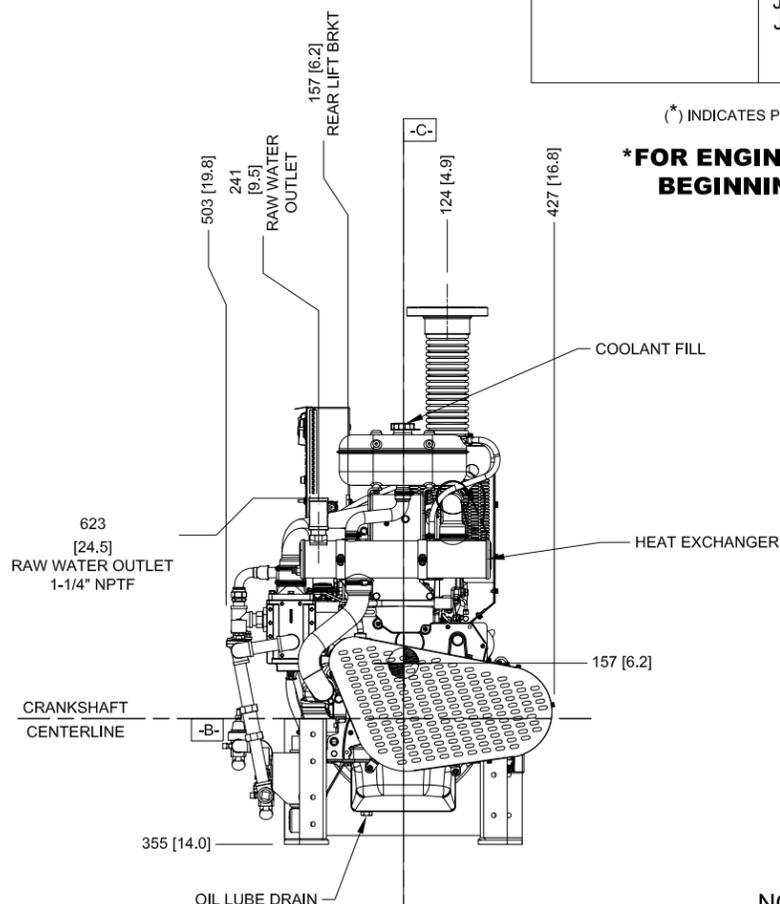
ATTENTION

REFER TO THE SPECIFIC MODEL
"INSTALLATION AND OPERATION DATA"
FOR INSTALLATION GUIDELINES

"TRWA" (TURBOCHARGED w/ RAW WATER AFTERCOOLING) MODELS	JU6H-UFAD88, -UFADK0* JU6H-UFADMG, -UFADN0 JU6H-UFADNG, -UFADP8 (MODELS SHOWN)
	JU6H-UFAD98 -UFADP0 JU6H -UFADQ0, -UFADR0 JU6H-UFADR8, -UFADS8 JU6H-UFADT0, -UFADW8 JU6H-UFADX8 SEE PG. 3 FOR RAW WATER INLET DIMENSIONS

(* INDICATES PLD ENINGE MODEL ONLY

***FOR ENGINES BUILT IN USA
BEGINNING APRIL 2015**



NOTES:

1. FUEL SUPPLY PIPING FROM TANK TO ENGINE SHOULD BE 1/2" MINIMUM PIPE DIAMETER.
2. FUEL RETURN PIPING FROM ENGINE TO TANK SHOULD BE 3/8" MINIMUM PIPE DIAMETER.

REV	DESCRIPTION	ECN#	DWN	APVD	DATE
M	ADDED FLYWHEEL INFORMATION	4071	JGV	<i>MCP</i>	04AUG15
N	REVISED ENGINE FOOT MOUNTING HOLE LOCATIONS PAGE 2	4275	CMM	<i>ASC</i>	01OCT15
P	ADDED GROUND STUD LOCATION	4359	DKP	<i>ASC</i>	11OCT15
Q	ADDED RAW WATER INLET DIMENSION TO PAGE 2. UPDATED COOLING LOOP GEOMETRY ON PAGE 3	4741	MJM	JCA	03FEB16
R	PAGE 3 DATUM A & B WERE INCORRECTLY POSITIONED	4788	RDR	<i>MCP</i>	11NOV16
S	ADDED DIMS TO ENGINE LIFTING BRACKETS	5061	MDM	<i>MCP</i>	21JUN17
T	ADDED GLAND PLATE DETAIL	5236	ECK	<i>MCP</i>	29NOV17
U	REMOVED OBSOLETE MODELS JU6H-UFAD58, UFADS0, UFADM8 UPDATED TOLERANCE, LOGO, & DIMENSION PRECISION	5393	NMM	<i>MCP</i>	24APR18

GENERAL TOLERANCES

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS (INCHES) AND MAY VARY ± 9.5 [0.38]

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YES
 NO
CONTROLLED DRAWING

DRWN: MWLEMING
DATE: 2/25/2009
ENGR: KJKUNKLER
MATERIAL:
ASSEMBLY:

CLARKE®

INSTALLATION DRAWING,
FIRE PUMP ENGINE JU6H
TIER 3 MODELS

PART NO. D628

SCALE: NTS UNITS: MM [INCH] PAGE 1 OF 3

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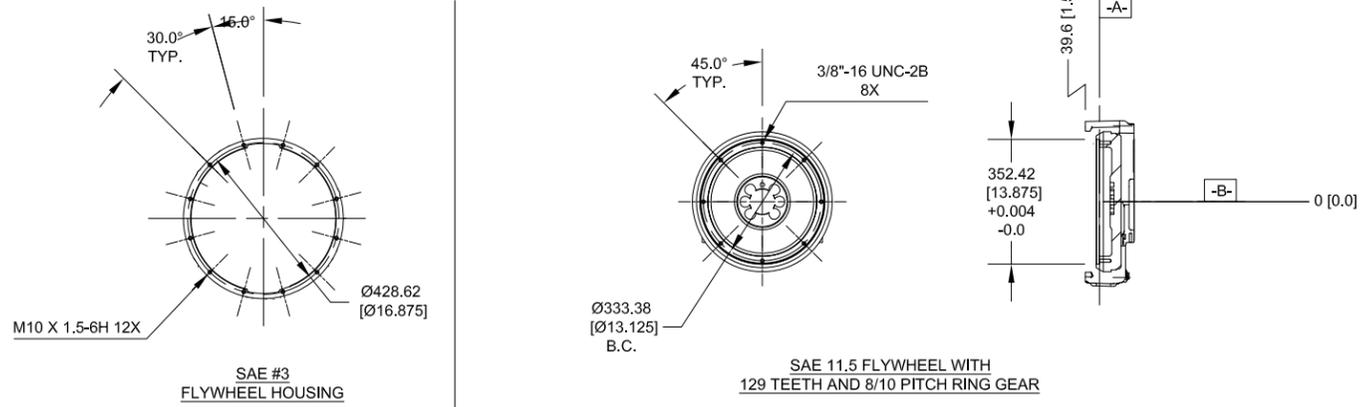
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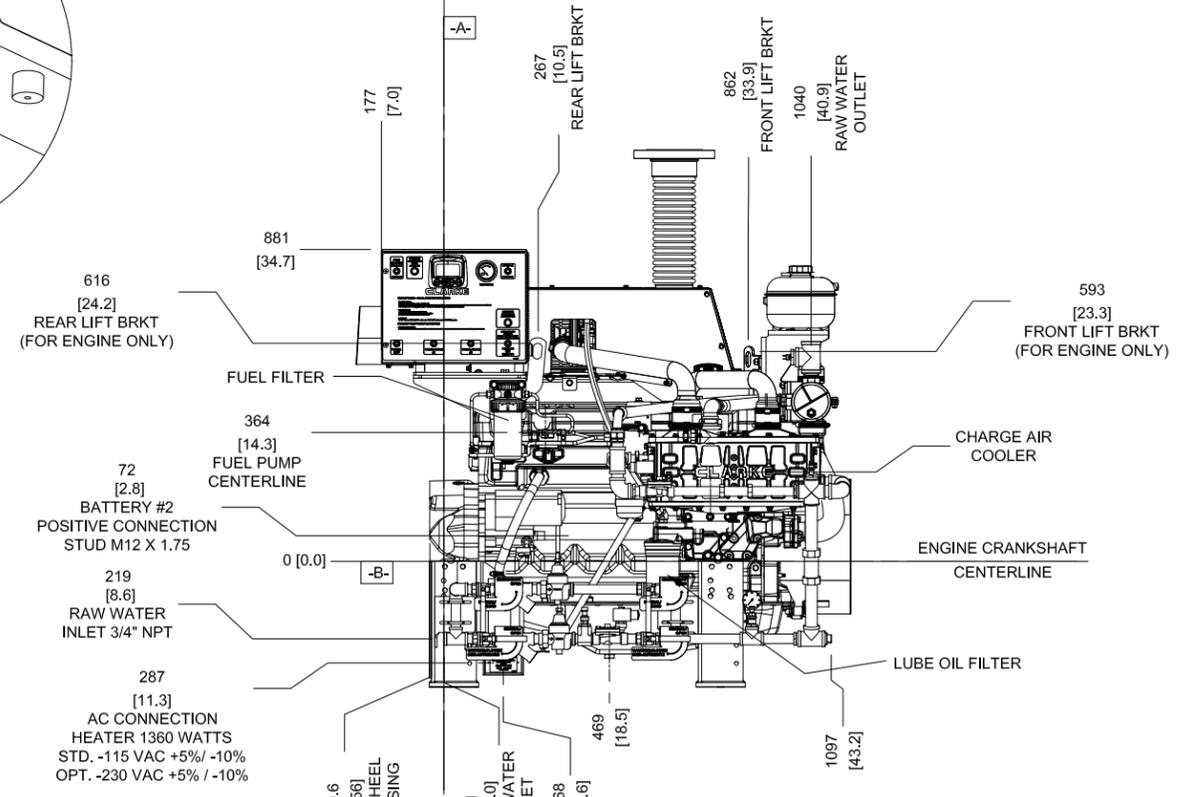
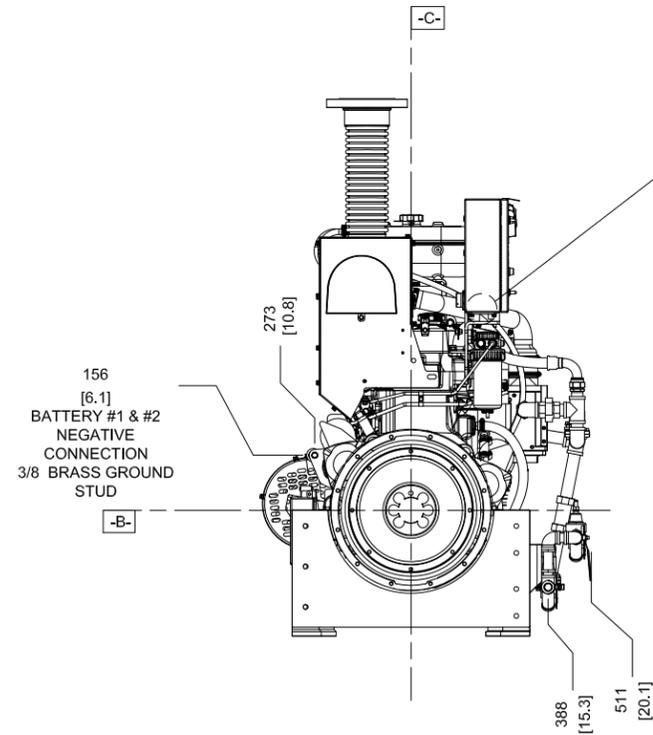
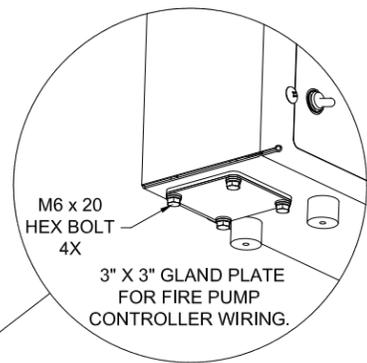
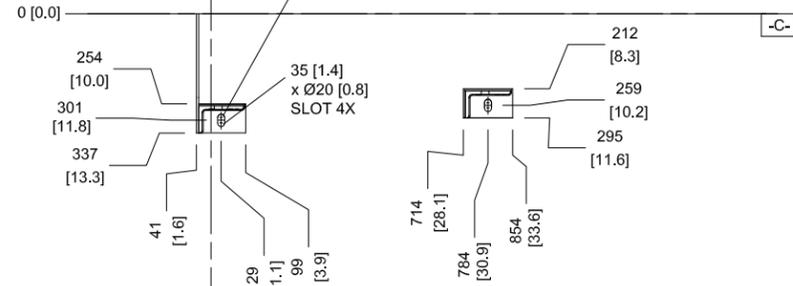
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DETAIL DATUM -A-



USE 3/4" MINIMUM MOUNTING HARDWARE (GRADE 8, CLASS 10.9 RECOMMENDED) 4X



DRAWING SUBJECT TO CHANGE WITHOUT NOTICE

***FOR ENGINES BUILT IN USA BEGINNING APRIL 2015**
FOR ENGINE SPECIFIC OPTIONS SEE www.CLARKEFIRE.com

GENERAL TOLERANCES

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YES NO
CONTROLLED DRAWING

DRWN MWLEMING

DATE 2/25/2009

ENGR KJKUNKLER

MATERIAL

ASSEMBLY

CLARKE®

INSTALLATION DRAWING, FIRE PUMP ENGINE JU6H TIER 3 MODELS

PART NO. D628

SCALE NTS UNITS MM [INCH]

REV U

PAGE 2 OF 3

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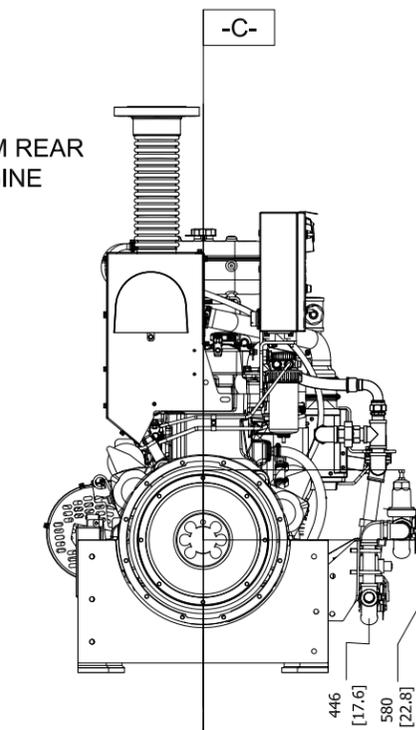
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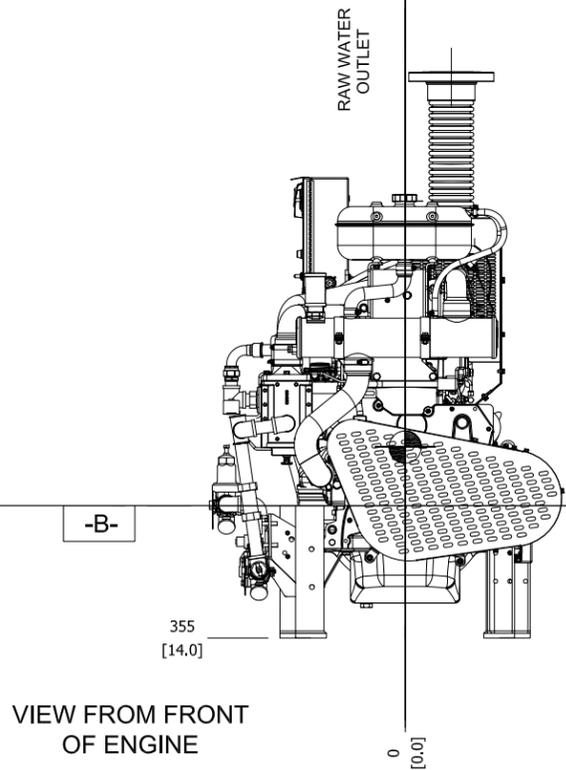
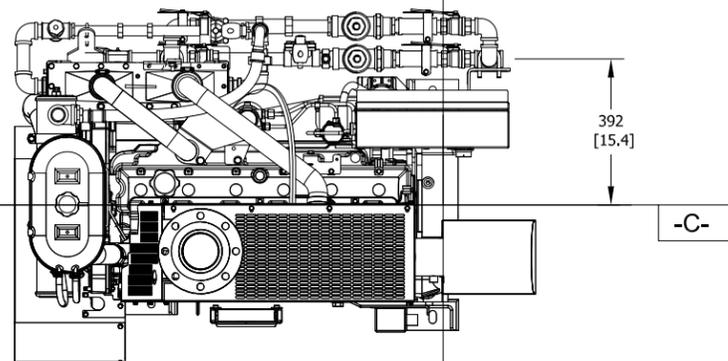
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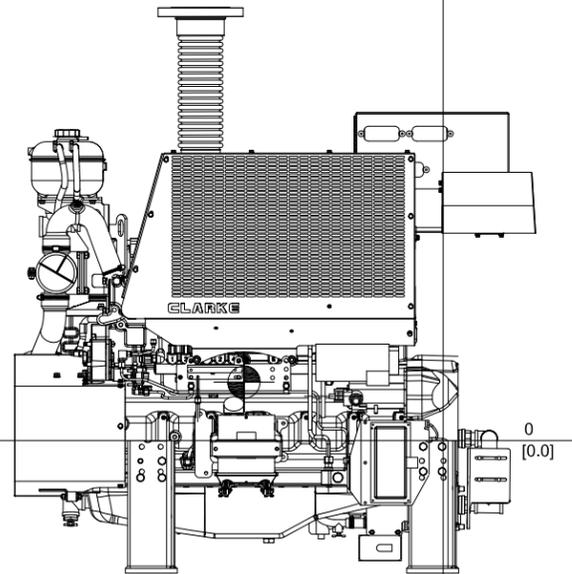
VIEW FROM REAR OF ENGINE



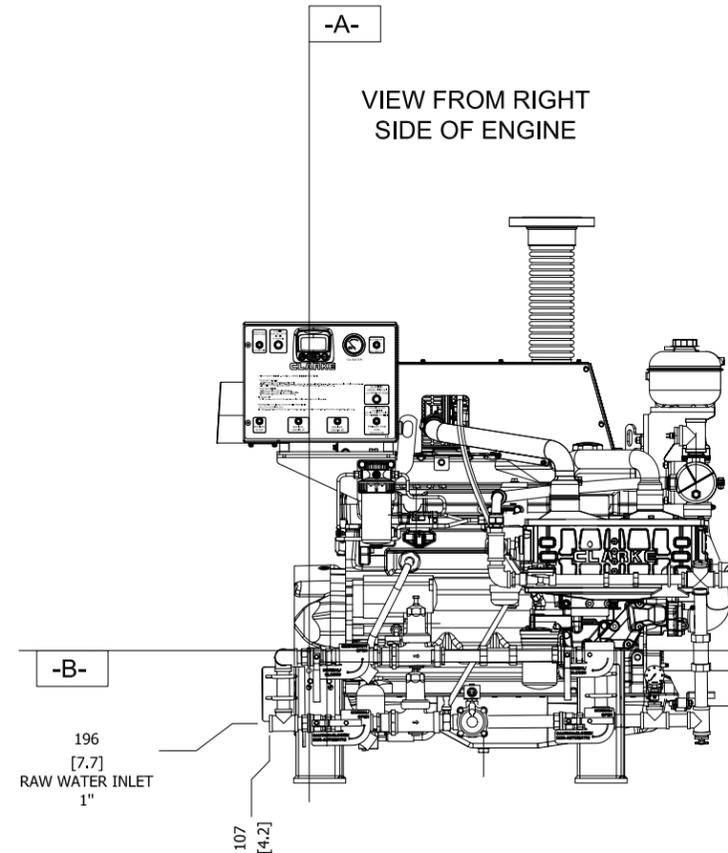
VIEW FROM TOP OF ENGINE



VIEW FROM FRONT OF ENGINE



VIEW FROM LEFT SIDE OF ENGINE



VIEW FROM RIGHT SIDE OF ENGINE

DO NOT SCALE

DATUMS

- A- - MOUNTING FACE OF FLYWHEEL
- B- - ENGINE CRANKSHAFT HORIZONTAL CENTERLINE
- C- - ENGINE CRANKSHAFT VERTICAL CENTERLINE
- CENTER OF GRAVITY OF ENGINE
- CLOCKWISE ROTATION WHEN VIEWED FROM FRONT OF ENGINE

TRWA
1" LOOP w/ 1 1/2" REGULATORS
MODELS

JU6H-UFAD98 -UFADP0
JU6H-UFADQ0, -UFADR0
JU6H-UFADR8, -UFADS8
JU6H-UFADT0, -UFADW8
JU6H-UFADX8

FOR ALL OTHER MODELS SEE PAGE 2

GENERAL TOLERANCES
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CONTROLLED DRAWING	
DRWN	MWLEMING
DATE	2/25/2009
ENGR	KJKUNKLER
MATERIAL	
ASSEMBLY	

CLARKE®		NAME	
		INSTALLATION DRAWING, FIRE PUMP ENGINE JU6H TIER 3 MODELS	
PART NO.		REV	
D628		U	
SCALE	UNITS		PAGE
NTS	MM [INCH]		3 OF 3



JU6H-UFADW8

INSTALLATION & OPERATION DATA (I&O)

USA Produced

Basic Engine Description

Engine Manufacturer	John Deere Co.
Ignition Type	Compression (Diesel)
Number of Cylinders	6
Bore and Stroke - in (mm)	4.19 (106) X 5 (127)
Displacement - in ³ (L)	415 (6.8)
Compression Ratio	17.0:1
Valves per cylinder	
Intake	2
Exhaust	2
Combustion System	Direct Injection
Engine Type	In-Line, 4 Stroke Cycle
Fuel Management Control	Electronic, High Pressure Common Rail
Firing Order (CW Rotation)	1-5-3-6-2-4
Aspiration	Turbocharged
Charge Air Cooling Type	Raw Water
Rotation, viewed from front of engine, Clockwise (CW)	Standard
Engine Crankcase Vent System	Open
Installation Drawing	D628
Weight - lb (kg)	1747 (792)

Power Rating

1760

Nameplate Power - HP (kW) ¹	282 (211)
--	-----------

Cooling System - [C051386]

1760

Engine Coolant Heat - Btu/sec (kW)	133 (140)
Engine Radiated Heat - Btu/sec (kW)	19.1 (20.2)
Heat Exchanger Minimum Flow	
60°F (15°C) Raw H ₂ O - gal/min (L/min)	28 (106)
100°F (37°C) Raw H ₂ O - gal/min (L/min)	38 (144)
Heat Exchanger Maximum Cooling Raw Water	
Inlet Pressure - psi (bar)	60 (4.1)
Flow - gal/min (L/min)	40 (151)
Typical Engine H ₂ O Operating Temp - °F (°C)	180 (82.2) - 195 (90.6)
Thermostat	
Start to Open - °F (°C)	180 (82.2)
Fully Opened - °F (°C)	203 (95)
Engine Coolant Capacity - qt (L)	22.2 (21)
Coolant Pressure Cap - lb/in ² (kPa)	15 (103)
Maximum Engine Coolant Temperature - °F (°C)	230 (110)
Minimum Engine Coolant Temperature - °F (°C)	160 (71.1)
High Coolant Temp Alarm Switch - °F (°C)	235 (113) - 241 (116)

Electric System - DC

Standard

Optional

System Voltage (Nominal)	12		24	
Battery Capacity for Ambients Above 32°F (0°C)				
Voltage (Nominal)	12	{C07633}	12	{C07633}
Qty. Per Battery Bank	1		2	
SAE size per J537	8D		8D	
CCA @ 0°F (-18°C)	1400		1400	
Reserve Capacity - Minutes	430		430	
Battery Cable Circuit, Max Resistance - ohm	0.0012		0.0012	
Battery Cable Minimum Size				
0-120 in. Circuit Length ²	00		00	
121-160 in. Circuit Length ²	000		000	
161-200 in. Circuit Length ²	0000		0000	
Charging Alternator Maximum Output - Amp,	40	{C071363}	55	{C071365}
Starter Cranking Amps, Rolling - @60°F (15°C)	440	{RE69704/RE70404}	250	{C07819/C07820}

* All footnotes are at the bottom of Page 2



JU6H-UFADW8 INSTALLATION & OPERATION DATA (I&O) USA Produced

Exhaust System (Single Exhaust Outlet)		1760	
Exhaust Flow - ft. ³ /min (m ³ /min)	1400 (39.6)		
Exhaust Temperature - °F (°C)	961 (516)		
Maximum Allowable Back Pressure - in H ₂ O (kPa)	30 (7.5)		
Minimum Exhaust Pipe Dia. - in (mm) ³	6 (152)		
Fuel System		1760	
Fuel Consumption - gal/hr (L/hr)	13.7 (51.9)		
Fuel Return - gal/hr (L/hr)	21.3 (80.6)		
Fuel Supply - gal/hr (L/hr)	35.0 (132)		
Fuel Pressure - lb/in ² (kPa)	3 (20.7) - 6 (41.4)		
Minimum Line Size - Supply - in.50 Schedule 40 Steel Pipe		
Pipe Outer Diameter - in (mm)	0.848 (21.5)		
Minimum Line Size - Return - in.375 Schedule 40 Steel Pipe		
Pipe Outer Diameter - in (mm)	0.675 (17.1)		
Maximum Allowable Fuel Pump Suction Lift			
with clean Filter - in H ₂ O (mH ₂ O)	80 (2)		
Maximum Allowable Fuel Head above Fuel pump, Supply or Return - ft (m)	6.6 (2)		
Fuel Filter Micron Size	2 (Secondary)		
Heater System		Standard	Optional
Engine Coolant Heater			
Wattage (Nominal)	1360		1360
Voltage - AC, 1 Phase	115 (+5% -10%)		230 (+5%, -10%)
Part Number	{C123640}		{C123644}
Air System		1760	
Combustion Air Flow - ft. ³ /min (m ³ /min)	474 (13.4)		
Air Cleaner	Standard		Optional
Part Number	{C03244}		{C03327}
Type	Indoor Service Only, with Shield		Canister, Single-Stage
Cleaning method	Washable		Disposable
Air Intake Restriction Maximum Limit			
Dirty Air Cleaner - in H ₂ O (kPa)	14 (3.5)		14 (3.5)
Clean Air Cleaner - in H ₂ O (kPa)	7 (1.7)		5 (1.2)
Maximum Allowable Temperature (Air To Engine Inlet) - °F (°C)	130 (54.4)		
Lubrication System			
Oil Pressure - normal - lb/in ² (kPa)	40 (276) - 60 (414)		
Low Oil Pressure Alarm Switch - lb/in ² (kPa) to	30 (207) - 35 (241)		
In Pan Oil Temperature - °F (°C)	220 (104) - 245 (118)		
Total Oil Capacity with Filter - qt (L)	34.3 (32.5)		
Lube Oil Heater		Optional	Optional
Wattage (Nominal)	150		150
Voltage	120V (+5%, -10%)		240V (+5%, -10%)
Part Number	{C04430}		{C04431}
Performance		1760	
BMEP - lb/in ² (kPa)	306 (2110)		
Piston Speed - ft/min (m/min)	1467 (447)		
Mechanical Noise - dB(A) @ 1m	C133379		
Power Curve	C132968		

NOTE: This engine is intended for indoor installation or in a weatherproof enclosure. ¹ Derate 3% per every 1000 ft. 304.8m above 300 ft. 91.4m and derate 1% for every 10°F 5.55 °C above 77°F 25°C. ² Positive and Negative Cables Combined Length. ³ Minimum Exhaust Pipe Diameter is based on: 15 feet of pipe, one 90° elbow, and one Industrial silencer. A Back-pressure flow analysis must be performed on the actual field installed exhaust system to assure engine maximum allowable back pressure is not exceeded. See Exhaust Sizing Calculator on www.clarkefire.com. { } indicates component reference part number.



Rating Specific Emissions Data

Nameplate Rating Information

Clarke Model	JU6H-UFADW8
Power Rating (BHP/kW)	282/211
Certified Speed (RPM)	1760

Refer to **Rating Data** section on page 2 for emissions output values

Rating Specific Emissions Data - John Deere Power Systems



Rating Data

Rating	6068HFC48A	
Certified Power(kW)	235	
Rated Speed	1760	
Vehicle Model Number	OEM (Clarke Fire Pump-	
Units	g/kW-hr	g/hp-hr
NO_x	3.61	2.69
HC	0.08	0.06
NO_x + HC	N/A	N/A
Pm	0.07	0.06
CO	0.6	0.4

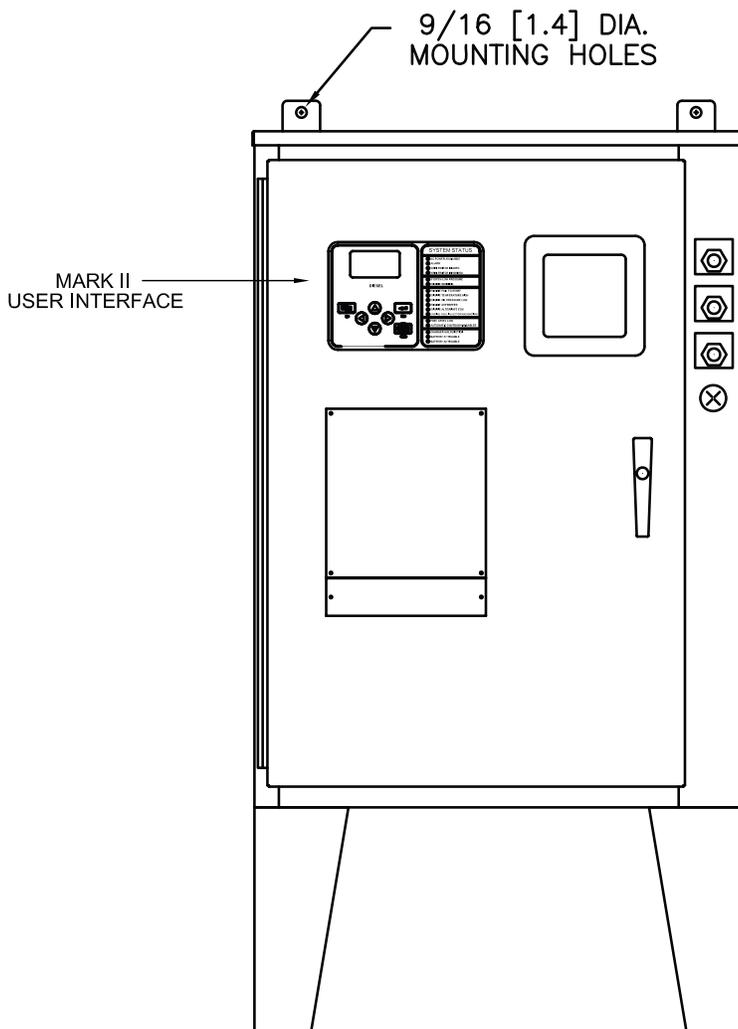
Certificate Data

Engine Model Year	2018	
EPA Family Name	JJDXL13.5103	
EPA JD Name	650HAA	
EPA Certificate Number	<u>JJDXL13.5103-010</u>	
CARB Executive Order		
Parent of Family	6135HF485A	
Units	g/kW-hr	
NO_x	3.31	
HC	0.11	
NO_x + HC	N/A	
Pm	0.10	
CO	0.6	

* The emission data listed is measured from a laboratory test engine according to the test procedures of 40 CFR 89 or 40 CFR 1039, as applicable. The test engine is intended to represent nominal production hardware, and we do not guarantee that every production engine will have identical test results. The family parent data represents multiple ratings and this data may have been collected at a different engine speed and load. Emission results may vary due to engine manufacturing tolerances, engine operating conditions, fuels used, or other conditions beyond our control.

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Emissions Results by Rating run on Jan-30-2018



(DRAWINGS INCLUDED IN THIS PACKAGE ARE FOR STANDARD CONTROLLERS. ACTUAL "AS BUILT" DRAWINGS MAY DIFFER FROM THOSE SEEN HERE).

FTA1100J

Firetrol Mark IIxG Diesel Engine Fire Pump Controller

FTA1100J - 12 or 24 Volt

Specifications

1.0 Main Fire Pump Controller

The main fire pump controller shall be a factory assembled, wired and tested unit. The controller shall be of the combined manual and automatic type designed for diesel engine operation of the fire pump.

1.1 Standards, Listings & Approvals

The controller shall conform to all the requirements of the latest editions of:
NFPA 20, *Standard for the Installation of Stationary Pumps for Fire Protection*
NFPA 70, *National Electrical Code*.

The controller shall be listed by:

Underwriters Laboratories, Inc., in accordance with UL218, *Standard for Fire Pump Controllers*
Canadian Standards Association CSA-C22.2, *Standard for Industrial Control Equipment (cUL)*

The controller shall be approved by:

Factory Mutual (IEC 62091)

1.2 Enclosure

The controller components shall be housed in a NEMA Type 2 (IEC IP22) drip-proof, wall mounted enclosure.

1.3 Operator Interface

The fire pump controller shall feature an operator interface with user keypad. The interface shall monitor and display motor operating conditions, including all alarms, events, and pressure conditions. All alarms, events, and pressure conditions shall be displayed with a time and date stamp. The display shall be a 128x64 Backlit LCD capable of customized graphics. The display and interface shall be NEMA rated for Type 2, 3R, 4, 4X, and 12 protection and shall be fully accessible without opening the controller door. The display and user interface shall utilize multiple levels of password protection for system security. A minimum of 3 password levels shall be provided.

1.4 Digital Status/Alarm Messages

The digital display shall indicate text messages for the status and alarm conditions of:

- Engine Run
- Remote Start
- Min. Run Time / Off Delay Time
- Manual Engine Crank
- Engine Fail To Start
- Electric Control Module (ECM) Warning
- Drive Not Installed
- ECM Failure
- Disk Error
- Low Suction Pressure PLD (Pressure Limiting Driver)
- Sequential Start Time
- High Raw Water Temp.
- Crank/Rest Time Cycle
- Clogged Raw Water Strainer
- Low Engine Temp.
- Interstitial/Fuel Spill
- Disk Near Full
- Pressure Error

The Sequential Start Timer and Minimum Run Timer/Off Delay Timer shall be displayed as numeric values reflecting the value of the remaining time.

1.5 LED Visual Indicators

LED indicators, visible with the door closed, shall indicate:

- AC Power Available
- Alarm
- Main Switch in Auto
- Main Switch In Manual
- System Pressure Low
- Engine Running
- Engine Fail To Start
- Engine Temperature High
- Engine Oil Pressure Low
- Engine Overspeed
- Engine Alternate ECM
- Engine Fuel Injector Malfunction
- Fuel Level Low
- Automatic Shutdown Disabled
- Charger Malfunction
- Battery #1 Trouble
- Battery #2 Trouble

1.6 Data Logging

The digital display shall monitor the system and log the following data:

- Motor Calls/Starts
- Pump Total Run Time
- Pump Last Run Time
- Total Controller Pwr On Time
- Last Pump Start
- Min/Max System Pressure
- Last High Temperature
- Last Low Oil Pressure
- Last Engine Overspeed
- Last Low Fuel Level
- Last Charger Fail
- Last Battery Trouble
- Battery #2 Volts (Min./Now/Max.)
- Battery #1 Volts (Min./Now/Max.)
- Battery #2 Amps (Min./Now/Max.)
- Battery #1 Amps (Min./Now/Max.)

1.7 Event Recording

Memory - The controller shall record all operational and alarm events to system memory. All events shall be time and date stamped and include an index number. The system memory shall have the capability of storing 3000 events and allow the user access to the event log via the user interface. The user shall have the ability to scroll through the stored messages in groups of 1 or 10.

1.8 USB Host Controller

The controller shall have a built-in USB Host Controller. A USB port capable of accepting a USB Flash Memory Disk shall be provided. The controller shall save all operational and alarm events to the flash memory on a daily basis. Each saved event shall be time and date stamped. The total amount of historical data saved shall solely depend on the size of the flash disk utilized. The controller shall have the capability to save settings and values to the flash disk on demand via the user interface.

1.9 Serial Communications

The controller shall feature a RS485 serial communications port for use with 2 or 4 wire Modbus RTU communications.

2.0 Solid State Pressure Transducer

The controller shall be supplied with a solid state pressure transducer with a range of 0-300 psi (0-20.7 bar) ± 1 psi. The solid state pressure switch shall be used for both display of the system pressure and control of the fire pump controller. Systems using analog pressure devices or mercury switches for operational control will not be accepted.

The START, STOP and SYSTEM PRESSURE shall be digitally displayed and adjustable through the user interface. The pressure transducer shall be mounted inside the controller to prevent accidental damage. The pressure transducer shall be directly pipe mounted to a bulkhead pipe coupling without any other supporting members. Field connections shall be made externally at the controller coupling to prevent distortion of the pressure switch element and mechanism.

2.1 Seismic Certification

The controller shall be certified to meet or exceed the requirements of the 2006 International Building Code and the 2010 California Building Code for Importance Factor 1.5 Electrical Equipment for Sds equal to 1.88 or less severe seismic regions. Qualifications shall be based upon successful tri-axial shake-table testing in accordance with ICC-ES AC-156. Certification without testing shall be unacceptable. Controller shall be clearly labeled as rated for installation in seismic areas and a Certificate of Conformance shall be provided with the controller.

2.2 Controller Operation

A digitally set On Delay (Sequential Start) timer shall be provided as standard. Upon a call to start, the user interface shall display a message indicating the remaining time value of the On Delay timer.

The controller shall be field programmable for manual stop or automatic stop. If set for automatic stopping, the controller shall allow the user to select either a Minimum Run Timer or an Off Delay Timer. Both timers shall be programmable through the user interface.

The controller shall include an AC Power Loss start timer to start the engine in the event of AC Power failure.

A weekly test timer shall be provided as standard. The controller shall have the ability to program the time, date, and frequency of the weekly test. In addition, the controller shall have the capability to display a preventative maintenance message for a service inspection. The message text and frequency of occurrence shall be programmable through the user interface.

A Lamp Test feature shall be included. The user interface shall also have the ability to display the status of the system inputs and outputs.

An Audible Test feature shall be included to test the operation of the audible alarm device.

2.3 Battery Chargers

The controller shall include two fully automatic, 200 amp hour, 4 step battery chargers. The chargers shall feature a qualification stage, in which the batteries are examined by the charger to insure that they are not defective and are capable of accepting a charge. The battery charger shall feature:

- Selectable AC Power Voltage
- Selectable Battery Voltage
- Selectable Battery Type
- Charge Cycle Reset Push-button

2.4 Manufacturer

The controller shall be a Firetrol brand.

ASCO Power
Technologies®

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www.firetrol.com

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Description – Firetrol® combined automatic and manual Mark IIxG based diesel engine fire pump controllers are intended for starting and monitoring fire pump diesel engines. They are suitable for use with both mechanical and electronic type engines. The controller is available for 12 or 24 volt negative ground systems, using lead acid or Nickel-Cadmium batteries. The controller monitors, displays and records fire pump system information.

Approvals – Firetrol fire pump controllers are listed by Underwriters' Laboratories, Inc., in accordance with UL218, *Standard for Fire Pump Controllers*, CSA, *Standard for Industrial Control Equipment (cUL)*, and approved by Factory Mutual. They are built to meet or exceed the requirements of the approving authorities as well as NEMA and the latest editions of NFPA 20, *Installation of Centrifugal Fire Pumps*, and NFPA 70, *National Electrical Code*.

Standard Features – The following are included as standard with each controller:

- AC Line & Battery circuit breakers
- Manual-Off-Auto selector switch
- Manual test push-button
- Two manual crank push-buttons
- Two 10 Amp battery chargers with 4 stage charging cycle, selectable AC voltage (110 / 220), selectable DC voltage (12 / 24), and selectable battery type (Lead Acid, Ni-Cad 9/18 Cell, Ni-Cad 10/20 Cell)
- Door mounted display/interface panel featuring a 128 x 64 pixel backlit LCD graphical display, Membrane Type User Control Push-buttons and easy to read LED Indicators for:
 - AC POWER AVAILABLE
 - ALARM
 - MAIN SWITCH IN AUTO
 - MAIN SWITCH IN MANUAL
 - SYSTEM PRESSURE LOW
 - ENGINE RUNNING
 - ENGINE FAIL TO START

- ENGINE TEMPERATURE HIGH
- ENGINE OIL PRESSURE LOW
- ENGINE OVERSPEED
- ENGINE ALTERNATE ECM
- ENGINE FUEL INJECTOR MALFUNCTION
- FUEL LEVEL LOW
- AUTOMATIC SHUTDOWN DISABLED
- CHARGER MALFUNCTION
- BATTERY #1 TROUBLE
- BATTERY #2 TROUBLE
- Minimum Run Timer / Off Delay Timer
- Programmable Daylight Saving Time Option
- Weekly Test Timer
- Engine Run Time Meter
- Digital Pressure Display
- USB Host Controller and Port
- Solid State Pressure Transducer
- Data Log
- Event Log (3000 events)
- Simultaneous Display of Battery Voltages, Charging Rates, AC Volts, Pressure and Alarm Messages
- Disk Error Message
- Disk Near Full Message
- Pressure Error Message
- Fail to Start Message
- Low Suction Pressure Message
- Crank Cycle Status Indication (Displays Cranking Battery, Number of Starting Attempts and Crank/Rest Time Remaining)
- 300 psi (20.7 bar) wet parts (solid state pressure transducer, solenoid valve, plumbing) for fresh water applications
- NEMA Type 2 enclosure (IEC IP22)
- Each standard controller comes with user set options for:
 - AC Power Loss Start
 - Low Pressure Aud.
 - Main Sw. Mis-Set
 - Pump Run Alarm
 - User Defined Input
 - Low Pump Rm Temp
 - Relief Valve Open
 - High Reservoir
 - Interlock Alarm
 - Low Suction
 - Manual Test
 - Remote Start
 - Weekly Test Setup
 - Low Reservoir
 - High Fuel Level
- Also included (as required) are Audible/Visible alarm notifications for:
 - Electronic Engine Control Module (ECM) Warning
 - Electronic Engine Control Module (ECM) Failure
 - Low Engine Temperature
 - High Raw Cooling Water Temperature
 - Low Raw Water Flow (Clogged Stainer)
 - Fuel Spill (Interstitial Space Liquid Intrusion)
 - Low Suction Pressure (At Variable Speed Suction Limiting Engine Controls)

Product Description - Options & Modifications

Special Enclosures

- E Enclosure, NEMA Type 4 (IEC IP 66), Painted Steel
- F Enclosure, NEMA Type 4X (IP66), #304 Stainless Steel, Brushed Finish
- FD Enclosure, NEMA Type 4X (IP66), #316 Stainless Steel, Brushed Finish
- FDB Enclosure, NEMA Type 4X (IP66), #316 Stainless Steel, 12 Gauge, Seam Welded, Brushed Finish
- FDP Enclosure, NEMA Type 4X, #316 Stainless Steel, Painted Finish
- FXP Enclosure, NEMA Type 4X (IP66), #304 Stainless Steel Painted Finish
- G Enclosure, NEMA Type 12 (IP54), Painted Steel
- T Enclosure, NEMA Type 3R (IP24), Painted Steel

Mounting Legs

- N31 Mounting Legs, Standard 12 Inch, Painted Steel
- N31S Mounting Legs, Standard 12 Inch, Stainless Steel

Anti-Condensation Space Heaters

- H Space Heater, 120V Externally Powered with Circuit Breaker
- J Space Heater, 120V Externally Powered with Circuit Breaker and Thermostat
- K Space Heater, 120V Externally Powered with Circuit Breaker and Humidistat
- L Space Heater, 240V Externally Powered with Circuit Breaker
- M Space Heater, 240V Externally Powered with Circuit Breaker and Thermostat
- N Space Heater, 240V Externally Powered with Circuit Breaker and Humidistat

Pressure Transducers, Solenoid Valves, Plumbing

- B Wetted Parts Including Pressure Sensor, 600 PSI (42 Bar), Fresh Water
- C Wetted Parts Including Pressure Sensor, 300 PSI (21 Bar), Sea Water
- D Wetted Parts Including Pressure Sensor, 600 PSI (42 Bar), Sea Water

Alarms

- AC Alarm Output Contacts, Extra, Engine Running (3 Sets)
- AJ Alarm Output Contacts, Engine Overspeed
- AK Alarm Output Contacts, Low Oil Pressure
- AL Alarm Output Contacts, High Water Temperature
- AM Alarm Output Contacts, Fail To Start
- AN Alarm Output Contacts, Battery / Charger Failure
- AP Alarm Output Contacts, Main Switch In Manual
- AR Alarm Output Contacts, Main Switch In Off
- AS Alarm Output Contacts, Main Switch In Auto
- AT Alarm Output Contacts, Pump Room Trouble¹
- AV Alarm Output Contacts, Low Pump Room Temperature¹
- AW Alarm Output Contacts, Reservoir Low¹
- AY Alarm Output Contacts, Low Suction Pressure¹
- COM Alarm, Audible/Visible/Output Contacts, Low Suction Pressure with Manual Reset Option. Pressure Switch Not Included¹

- CPL Alarm Output Contacts, Overpressure (for use with PLD engines only)
- CTS Alarm, Audible/Visible/Output Contacts, Low Suction Pressure with Manual Reset Option and Pressure Switch
- ECMFR Alarm Output Contacts, Electronic Engine ECM Failure
- ECMWR Alarm Output Contacts, Electronic Engine ECM Warning
- EE Alarm Output Contacts, Extra, Engine Trouble (1 Set)
- EF Alarm Output Contacts, Extra, Main Switch Not In Auto (1 Set)
- EH Alarm Output Contacts, Relief Valve Discharge¹
- EJ Alarm, Audible/Visible, Flow Meter On¹
- HRTR Alarm Output Contacts, High Raw Water Temperature
- EK Alarm Output Contacts, Flow Meter On¹ (Requires option -EJ)
- LETR Alarm Output Contacts, Low Engine Temperature
- LRFR Alarm Output Contacts, Low Raw Water Flow (Clogged Strainer)
- JR Visible Indicator, Jockey Pump Operating (Requires Jockey Pump To Be Ordered With Option -AC)
- LSPR Alarm Output Contacts, Low Suction Pressure (at Variable Speed Suction Limiting Engine Controls)
- JT Alarm, Audible/Visible, Jockey Pump Trouble (Requires Jockey Pump To Be Ordered With Option -KH)
- LC Alarm Output Contacts, High Fuel Level¹
- LE Alarm Output Contacts, Fuel Spill
- LG Alarm Output Contacts, Reservoir High¹
- PE Alarm Output Contacts, Low System Pressure (Pump On Demand)

Miscellaneous

- AZ Thermostat, Low Pump Room Temperature, Mounted and Wired
- BA AC Input, 220-240V
- EL Series Pumping Operation, High Zone Controller
- EM Series Pumping Operation, Mid Zone Controller
- EN Series Pumping Operation, Low Zone Controller
- IEC Marking, CE With External Wet Parts
- IECI Marking, CE With Internal Wet Parts
- OSP Marking, OSHPD Seismic Certification, State of California (Requires Option -SEI)
- S Tropicalization
- SEI Marking, Seismic Certified (in accordance with IBC)
- USBX Data Port, External USB
- ZPA Scheduled Service Message
- ZPM Data Port, Serial Modbus RTU Over 2-Wire or 4-Wire RS485
- ZPN Data Port, Serial Modbus RTU Over Ethernet TCP/IP

- FTA1100-K1 Low fuel level switch, 16" max insertion length²
- FTA1100-K1-X High/Low fuel level switch - specify levels/tank dimensions
- FTA1100-K2 Low fuel level switch, 25" max. insertion length²
- FTAK21 380-480 volt operation (transformer)²
- Export packaging (Wooden crating to conform to IPPC Standards)

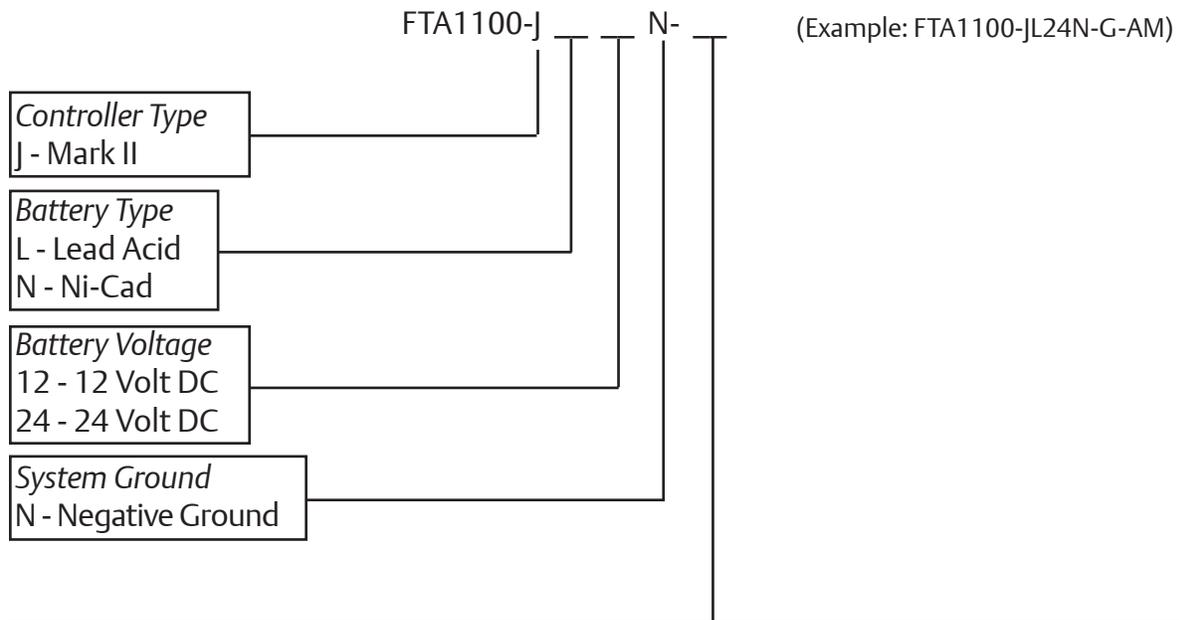
¹ - Initiating switches by others

² - Shipped loose for installation by the customer

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Options and Modifications

Special Enclosures

- T NEMA Type 3R (IEC IP22), Painted Steel
- E NEMA Type 4 (IEC IP 66), Painted Steel
- F NEMA Type 4X (IEC IP66) #304 Stainless Steel, Brushed Finish
- FXP NEMA Type 4X (IEC IP66) #304 Stainless Steel, Painted Finish
- FD NEMA Type 4X (IEC IP66) #316 Stainless Steel, Brushed Finish
- FDB NEMA Type 4X (IEC IP66) #316 Stainless Steel, 12 Gauge, Seam Welded, Brushed Finish
- FDP NEMA Type 4X (IEC IP66) #316 Stainless Steel, Painted Finish
- G NEMA Type 12 (IEC IP54)

Mounting Legs

- N31 Standard 12" Mounting Legs
- N31S 12" Mounting Legs, Stainless Steel

Anti-Condensation Space Heaters

- H 120 Volt Space Heater
- J 120 Volt Space Heater with Thermostat
- K 120 Volt Space Heater with Humidistat
- L 240 Volt Space Heater
- M 240 Volt Space Heater with Thermostat
- N 240 Volt Space Heater with Humidistat

Pressure Transducers, Solenoid Valves, Plumbing

- B 0-600 psi (0-41.4 bars) wet parts for fresh water applications
- C 0-300 psi (0-20.7 bars) wet parts for copper corrosive applications
- D 0-600 psi (0-41.4 bars) wet parts for copper corrosive applications

Continued on other side

Model Number Selection Guide - Options & Modifications

Alarms

- AC Additional contacts for remote indication, engine running - 2 sets provided as standard
- AJ Contacts for remote indication, engine over-speed
- AK Contacts for remote indication, low oil pressure
- AL Contacts for remote indication, high water temperature
- AM Contacts for remote indication, engine failed to start
- AN Contacts for remote indication, battery / charger failure
- AP Contacts for remote indication, main switch in manual
- AR Contacts for remote indication, main switch in off
- AS Contacts for remote indication, main switch in auto
- AT Contacts for remote indication, pump room trouble¹
- AV Contacts for remote indication, low pump room temperature¹
- AW Contacts for remote indication, reservoir low¹
- AY Contacts for remote indication, low suction pressure¹
- COM Visible low suction pressure alarm, Manual reset only (Includes reset push-button, initiating pressure switch not included)¹
- CPL Contacts for remote indication, system 115% over pressure (for use with PLD engines only)
- CTS Built-in low suction pressure alarm panel (Includes selectable auto/manual reset, audible, visible and remote alarms and mounted and wired pressure switch)
- EE Additional contacts for remote indication, engine trouble - 1 set provided as standard
- EF Additional contacts for remote indication, main switch mis-set - 1 set provided as standard
- EH Contacts for remote indication, relief valve discharge¹
- EJ Audible & Visible flow meter on alarm¹
- EK Contacts for remote indication, flow meter on¹ (Requires option -EJ)
- JR Visible jockey pump running indication

- JT Audible and visible jockey pump trouble indication
- LC Contacts for remote indication, high fuel level¹
- LD Audible & Visible fuel spill alarm¹
- LE Contacts for remote indication, fuel spill¹ (Requires option -LD)
- LG Contacts for remote indication, reservoir high¹
- PE Contacts for remote indication, low system pressure (Pump On Demand)

Miscellaneous

- AZ Low pump room temperature switch, mounted and wired
- BA 220-240 Volt operation
- EL Series pumping, high zone controller
- EM Series pumping, mid zone controller
- EN Series pumping, low zone controller
- IEC CE Marking with Externally Mounted Wet Parts
- IECI CE Marking (Internal Wet Parts)
- OSP OSHPD Seismic Certification (State of California) (Requires Option -SEI)
- S Tropicalization
- SEI Seismic Certification (in accordance with IBC)
- USBX External USB Port
- ZPA Customized, annual service display message (factory programmed)
- ZPN Serial Modbus RTU over Ethernet TCP/IP using 5150 Connectivity Module
- ZPM Serial Modbus RTU over 2-wire or 4-wire RS485

- FTA1100-K1 Low fuel level switch, 16" max insertion length²
- FTA1100-K1-X High/Low fuel level switch - specify levels/tank dimensions
- FTA1100-K2 Low fuel level switch, 25" max. insertion length²
- FTAK21 380-480 volt operation (transformer)²
- Export packaging (Wooden crating to conform to IPPC Standards)

¹ - Initiating switches by others

² - Shipped loose for installation by the customer

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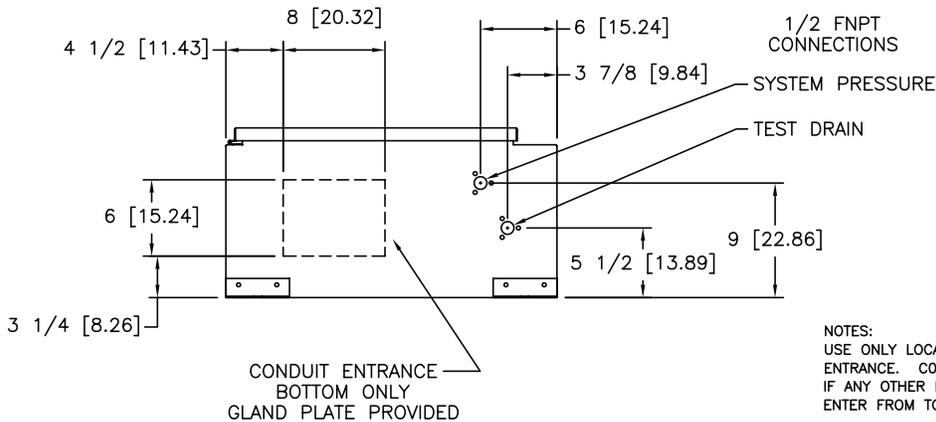
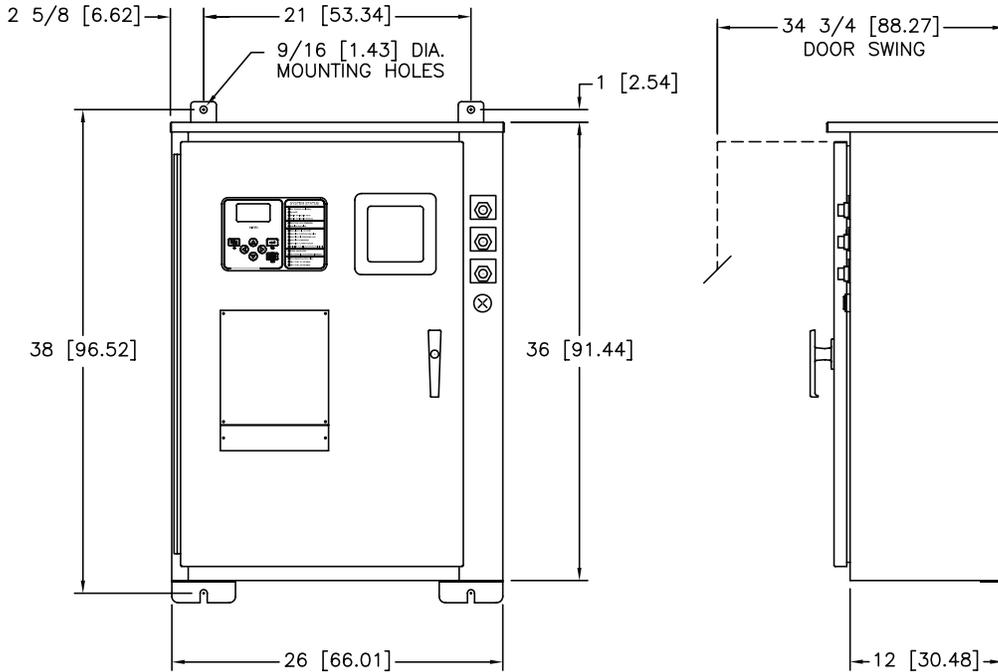
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Publication SD1100-50 Rev. D



Mark IIXG Diesel Engine Fire Pump Controller

FTA1100J
Wall Mount
Dimensional Drawing



NOTES:
USE ONLY LOCATIONS SHOWN FOR CONDUIT ENTRANCE. CONTROLLER WARRANTY IS VOID IF ANY OTHER LOCATION IS USED. DO NOT ENTER FROM TOP.

NOT TO BE USED AS A JUNCTION BOX. DO NOT ROUTE ENGINE HEATER WIRING THROUGH CONTROLLER.

DO NOT INSTALL IN AMBIENT TEMPERATURES BELOW 41°F (5°C)

DIMENSIONS SHOWN ON THIS DRAWING ARE APPLICABLE FOR NEMA TYPES 2/3R/4/4X/12

ALL DIMENSIONS - INCHES [CM]
SHIPPING WEIGHT - POUNDS [KG]

FOR CONTROLLERS WITH 12" [30.5] FLOOR MOUNTING LEGS
MODIFICATION -N31 RE: DRAWING DD1100-21
FOR CONTROLLERS WITH 6" [15.24] BASE MOUNTING LEGS
MODIFICATION -N32 RE: DRAWING DD1100-22

APPROXIMATE
SHIPPING WEIGHT
200 [90.7]

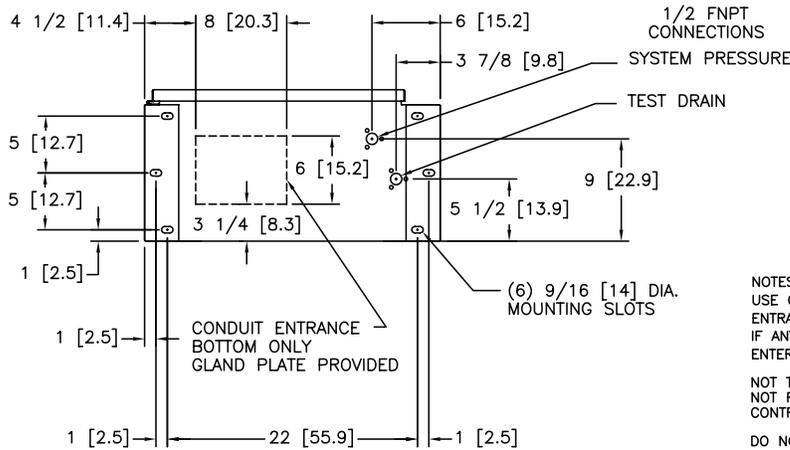
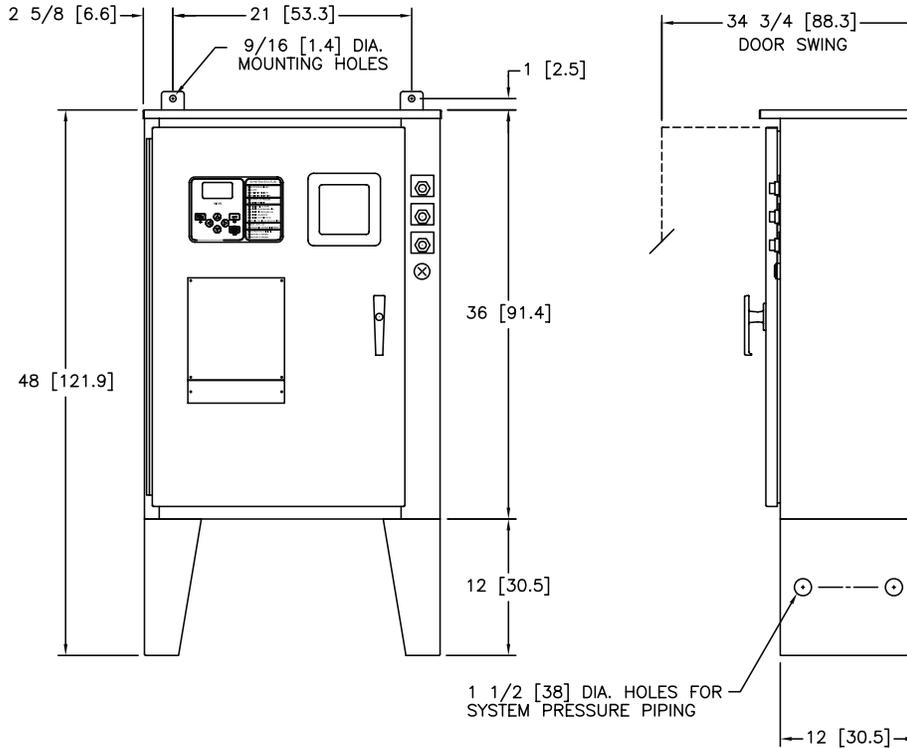
CHANGED PRESSURE FITTING AND CONDUIT ENTRANCE DIMENSIONS				REV. TO C	ECN NO. 228698	BY JC	APP. TEF	DATE 08-20-10
UPDATED TO MARK IIXG USER INTERFACE				REV. TO B	ECN NO. 225152	BY JC	APP. TEF	DATE 11-11-09
DIMENSIONS AND SHIPPING WEIGHT FTA1100-J						<p>THIRD ANGLE PROJECTION</p>		
DIESEL ENGINE FIRE PUMP CONTROLLER WALL MOUNT								
DRAWN BY	TEF	DATE	12-14-02	MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-055		ASSEM. REF. NO.		
CHECKED				PROPERTY OF ASCO POWER TECHNOLOGIES. USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.		COMPUTER GENERATED DRAWING		
PROJECT APPROVAL				SCALE 1:1		SIZE A		DWG. NO.
FINAL APPROVAL	TEF	DATE	12-14-02	ASCO ASCO POWER TECHNOLOGIES, L.P. FLORHAM PARK, NEW JERSEY 07932 U.S.A.		DD1100-20		DRAWING REV. C ECN NO. 228698 SHEET 1 OF 1





Mark IIxG Diesel Engine Fire Pump Controller

FTA1100J
With Modification N31 - 12" Mounting Legs
Dimensional Drawing



NOTES:
USE ONLY LOCATIONS SHOWN FOR CONDUIT ENTRANCE. CONTROLLER WARRANTY IS VOID IF ANY OTHER LOCATION IS USED. DO NOT ENTER FROM TOP.

NOT TO BE USED AS A JUNCTION BOX. DO NOT ROUTE ENGINE HEATER WIRING THROUGH CONTROLLER.

DO NOT INSTALL IN AMBIENT TEMPERATURES BELOW 41°F (5°C)

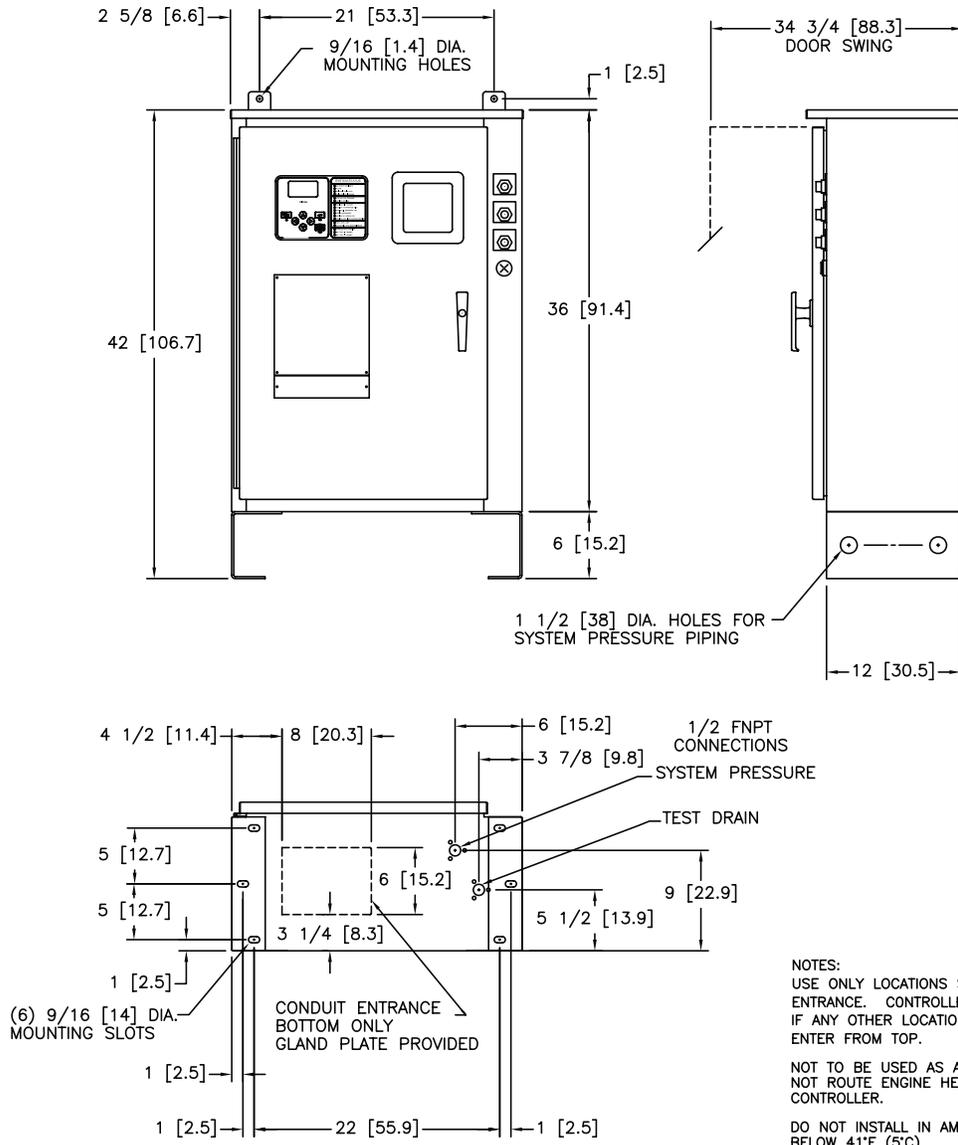
DIMENSIONS SHOWN ON THIS DRAWING ARE APPLICABLE FOR NEMA TYPES 2/3R/4/4X/12

ALL DIMENSIONS - INCHES [CM]
SHIPPING WEIGHT - POUNDS [KG]

APPROXIMATE SHIPPING WEIGHT
200 [90.7]

CHANGED PRESSURE FITTING AND CONDUIT ENTRANCE DIMENSIONS				REV. TO B	ECN NO. 228698	BY JC	APP. TEF	DATE 08-20-10	
UPDATED TO MARK IIXG USER INTERFACE				REV. TO A	ECN NO. 225152	BY JC	APP. TEF	DATE 11-11-09	
DIMENSIONS AND SHIPPING WEIGHT FTA1100-J						<p>THIRD ANGLE PROJECTION</p>			
DIESEL ENGINE FIRE PUMP CONTROLLER WITH MODIFICATION N31 (12" MOUNTING LEGS)									
DRAWN BY	RW	DATE	11-17-03	MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-055		ASSEM. REF. NO.			
CHECKED				PROPERTY OF ASCO POWER TECHNOLOGIES. USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.				COMPUTER GENERATED DRAWING	
PROJECT APPROVAL				ASCO		ASCO POWER TECHNOLOGIES, L.P.		SCALE 1:1	
FINAL APPROVAL	TEF	DATE	11-17-03	FLORHAM PARK, NEW JERSEY 07932 U.S.A.		DD1100-21		SIZE A	
				DRAWING REV. B	ECN NO. 228698	SHEET 1 OF 1			





NOTES:
USE ONLY LOCATIONS SHOWN FOR CONDUIT ENTRANCE. CONTROLLER WARRANTY IS VOID IF ANY OTHER LOCATION IS USED. DO NOT ENTER FROM TOP.

NOT TO BE USED AS A JUNCTION BOX. DO NOT ROUTE ENGINE HEATER WIRING THROUGH CONTROLLER.

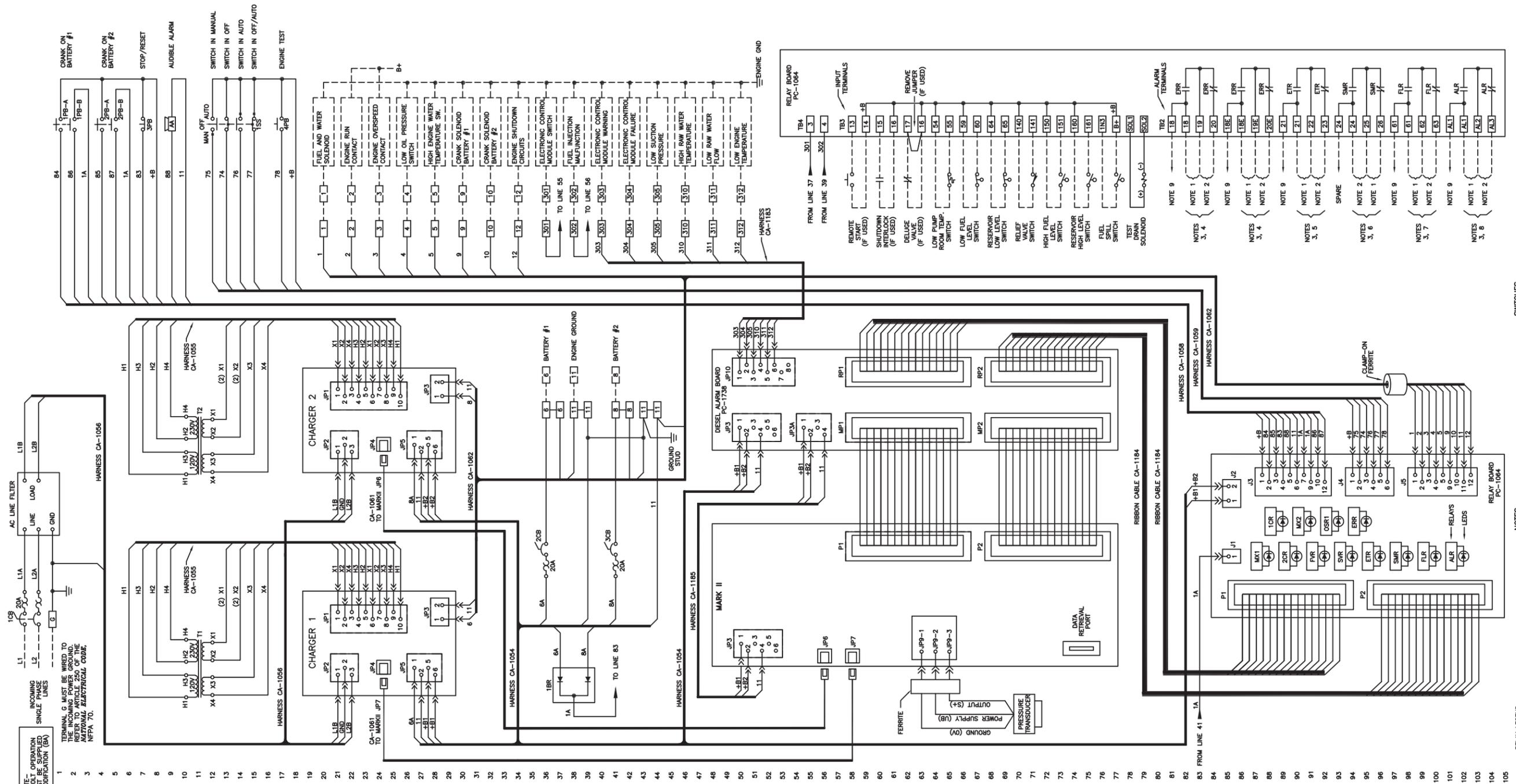
DO NOT INSTALL IN AMBIENT TEMPERATURES BELOW 41°F (5°C)

DIMENSIONS SHOWN ON THIS DRAWING ARE APPLICABLE FOR NEMA TYPES 2/3R/4/4X/12

ALL DIMENSIONS - INCHES [CM]
SHIPPING WEIGHT - POUNDS [KG]

APPROXIMATE SHIPPING WEIGHT
200 [90.7]

CHANGED PRESSURE FITTING AND CONDUIT ENTRANCE DIMENSIONS				REV. TO B	ECN NO. 228698	BY JC	APP. TEF	DATE 08-20-10
UPDATED TO MARK IIXG USER INTERFACE				REV. TO A	ECN NO. 225152	BY JC	APP. TEF	DATE 11-11-09
DIMENSIONS AND SHIPPING WEIGHT FTA1100-J						<p>THIRD ANGLE PROJECTION</p>		
DIESEL ENGINE FIRE PUMP CONTROLLER WITH MODIFICATION N32 (6" BASE MOUNTING LEGS)								
DRAWN BY	RW	DATE	01-17-03	MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-055		ASSEM. REF. NO.		
CHECKED				PROPERTY OF ASCO POWER TECHNOLOGIES. USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.				COMPUTER GENERATED DRAWING
PROJECT APPROVAL				SCALE 1:1		SIZE A		
FINAL APPROVAL	TEF	DATE	01-07-03	DWG. NO. DD1100-22				
				DRAWING REV. B	ECN NO. 228698	SHEET 1 OF 1		



NOTE: FOR 220-240 VOLT OPERATION SINGLE PHASE WIRING WITH FACTORY MODIFICATION (BA).
 TERMINAL G MUST BE WIRED TO THE INCOMING POWER GROUND. TO MAINTAIN FACTORY WIRING, USE A MINIMUM 14 AWG COPPER WIRE.

SYMBOL LEGEND
 -FIELD CONNECTION
 -ENGINE MOUNTED TERMINAL BLOCK
 -INDICATES FACTORY INSTALLED WIRING

SWITCHES
 1CR - PUSHBUTTON "CRANK ON BATTERY #1"
 2PR - PUSHBUTTON "CRANK ON BATTERY #2"
 3PR - PUSHBUTTON "STOP/RESET"
 4PR - PUSHBUTTON "ENGINE TEST"
 1SR - FUEL VALVE SWITCH
 1CR - AC POWER CIRCUIT BREAKER
 1CB - BATTERY #1 CIRCUIT BREAKER
 2CB - BATTERY #2 CIRCUIT BREAKER
 3CB - CIRCUIT BREAKER - LINE 94

NOTES
 1 - NORMALLY OPEN TO ALARM
 2 - NORMALLY CLOSED TO ALARM
 3 - ALARM CONTACT RATING 10 AMP MAX, 250 VAC, 30 VDC
 4 - TO ENGINE RUNNING REMOTE ALARM CIRCUITS
 6 - TO MAIN SWITCH MIS-SET REMOTE ALARM CIRCUITS
 7 - TO LOW FUEL LEVEL REMOTE ALARM CIRCUITS
 8 - TO FUEL VALVE REMOTE ALARM CIRCUITS
 9 - SPARE TERMINAL PROVIDED FOR PARALLEL CONNECTION
 OF REMOTE ALARMS (IF REQUIRED)

RELAY LEGEND
 MK1 - MAIN SWITCH AUXILIARY RELAY
 1CR - CRANK RELAY BATTERY #1
 2CR - CRANK RELAY BATTERY #2
 FVR - FUEL VALVE RELAY
 SVR - ENGINE OVERSPEED RELAY
 ETR - TEST SOLENOID RELAY
 SMR - ENGINE TROUBLE RELAY
 FLR - ENGINE TROUBLE RELAY
 ALR - MAIN SWITCH MIS-SET RELAY
 AL1 - LOW FUEL LEVEL RELAY
 AL2 - COMMON ALARM RELAY

PROJECT NAME:		REV. TO SHEET		ECN NO.	BY	APP.	DATE
WIRING SCHEMATIC		FTA1100-J					
MARK II DIESEL ENGINE FIRE PUMP CONTROLLER - STANDARD WIRING SCHEMATIC							
DRAWN BY	TEF	DATE	11/04/02	MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-005.		ASSEM. REF. NO.	COMPUTER GENERATED DRAWING
CHECKED				PROPERTY OF ASCO POWER TECHNOLOGIES. USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.			SCALE 1:1 SIZE B
PROJECT APPROVAL				ASCO® ASCO POWER TECHNOLOGIES, L.P. FLORHAM PARK, NEW JERSEY 07932 U.S.A.			DWG. NO. WS1100-20
FINAL APPROVAL	TEF	DATE	11/04/02	DRAWING REV.	G	ECN NO. 255410	SHEET 1 OF 1

REVISED PER FM & NFPA-20 ADDITIONAL ALARM REQUIREMENTS	G	255410	GFD	GFD	6/19/15
REVISED PRESSURE TRANSDUCER	F	229677	GFD	GFD	11/12/10
REVISED TEST DRAIN SOLENOID CONNECTION & ADDED ELECTRONIC ENGINE TERMINALS	E	222294	GFD	GFD	4/1/09

THIS FIELD CONNECTION DIAGRAM IS FOR DIESEL ENGINES LISTED FOR DRIVING CENTRIFUGAL FIRE PUMPS SUPPLIED BY THE FOLLOWING MANUFACTURERS:

CATERPILLAR, INC., ENGINE DIVISION, PEORIA, IL
 CLARKE DETROIT DIESEL-ALLISON, INC., CINCINNATI, OH
 CUMMINS ENGINE CO., INC., COLUMBUS, IN
 DEUTZ CORP., NORDRHOSS, GA.
 KIRLOSKAR CUMMINS, LTD., PUNE, INDIA

FOR ENGINES OR MANUFACTURERS NOT LISTED ABOVE, CONSULT THE FACTORY.

-NOTES-

- IF CONTROLLER IS ARRANGED FOR OPERATION ON 220-240 VOLTS (MODIFICATION -BA) CONNECT TO THESE TERMINALS
- TERMINAL G MUST BE WIRED TO INCOMING LINE BONDED GROUND. REFER TO ARTICLE 250, NATIONAL ELECTRICAL CODE, NFPA70.
- TERMINALS 1 THRU 12, 301 THRU 305, & 310 THRU 312 CONNECT TO LIKE NUMBERED TERMINALS ON THE ENGINE TERMINAL BLOCK. SOME ENGINES MAY NOT USE ALL TERMINALS. REFER TO ENGINE MANUFACTURER'S WIRING DIAGRAM FOR CORRECT CONNECTIONS.
- ENGINE TROUBLE ALARM CIRCUITS OPERATE IF ANY ONE OR MORE OF THE FOLLOWING TROUBLES OCCUR: ENGINE OVERSPEED, LOW OIL PRESSURE, HIGH WATER TEMPERATURE, BATTERY CHARGER OR BATTERY FAILURE, FAILED TO START, AND STARTING CONTACTOR COIL FAILURE. ELECTRONIC ENGINE ALARMS (TERMINALS 301-312) ARE FIELD PROGRAMMABLE FOR INCLUSION IN ENGINE TROUBLE ALARM.
- SPARE TERMINAL PROVIDED FOR PARALLEL CONNECTION OF REMOTE ALARMS (IF REQUIRED).
- COMMON TROUBLE ALARM CIRCUIT OPERATES WHEN ANY ALARM OCCURS.

-GENERAL NOTES-

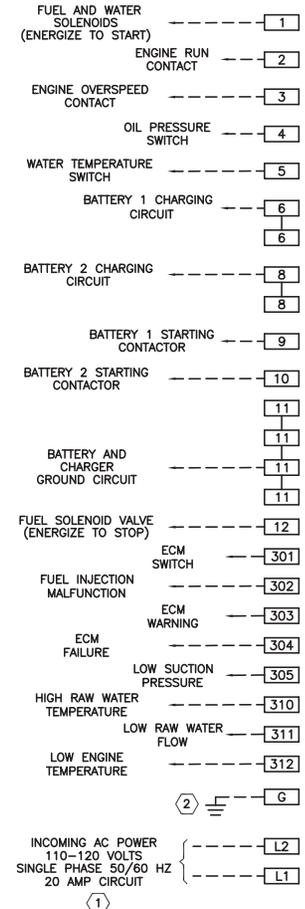
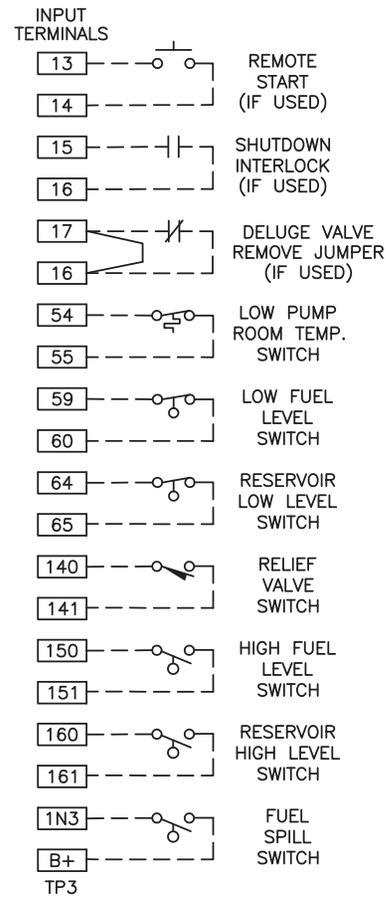
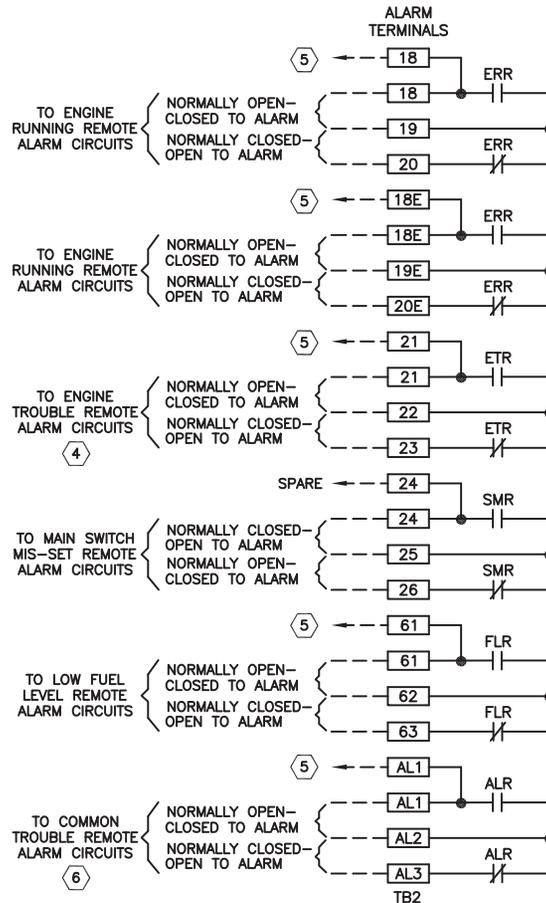
ALL ALARM CONTACTS ARE RATED FOR PILOT CIRCUIT DUTY, 250 VAC, 30 VDC MAXIMUM, 10 AMPERES, NON-INDUCTIVE.

**-WIRE SIZES-
COPPER CONDUCTORS ONLY**

USE #14 AWG WIRE [16 MWG] MINIMUM FOR ALL ELECTRICAL CONNECTIONS EXCEPT FOR BATTERY CHARGER CONNECTIONS. (BATTERY CHARGERS CONNECTED TO TERMINALS 6, 9 AND 11) ON TERMINALS 6, 9 AND 11 USE THE FOLLOWING INFORMATION TO DETERMINE WIRE SIZES:

LINEAR FEET (N CONDUIT RUN) FROM CONTROLLER TO TERMINAL BLOCK ON ENGINE	MINIMUM WIRE SIZE
0' - 25' [7.62m]	#10 AWG [6 MM ²]
25' - 50' [7.62m - 15.24m]	#8 AWG [10 MM ²]

TERMINALS AND TIGHTENING TORQUE		
TERMINAL TYPE	WIRE SIZE	TIGHTENING TORQUE
POWER TERMINALS 45 AMP (G, 1-12)	#14-8 AWG [2.5-10 MM ²]	14.2 in-lb [1.6 Nm]
CONTROL AND ALARM TERMINALS (TB2, TB3)	#14-12 AWG [2.5-4 MM ²]	5.6 in-lb [.6 Nm]
CONTROL AND ALARM TERMINALS (301-312)	#14-12 AWG [2.5-4 MM ²]	7.1 in-lb [.8 Nm]
CIRCUIT BREAKERS	#14-4 AWG [2.5-25 MM ²]	17.5 in-lb [2 Nm]



REVISED PER FM & NFPA-20 ADD'L ALARM REQUIREMENTS	E	255410	GFD	GFD	6/19/15
DESCRIPTION	REV. TO SHEET	ECN NO.	BY	APP.	DATE

PRESSURE SYSTEM CONNECTION
1/2" FNPT

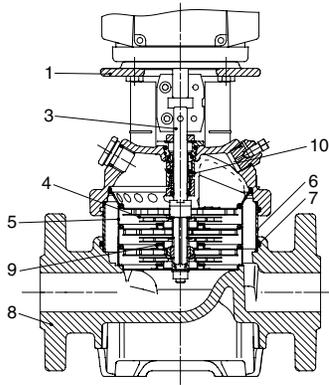
PROJECT NAME:		REV. TO SHEET	ECN NO.	BY	APP.	DATE
FIELD CONNECTIONS		FTA1100-J		THIRD ANGLE PROJECTION		
MARK II DIESEL ENGINE FIRE PUMP CONTROLLER - STANDARD FIELD CONNECTIONS						
BY	DATE	MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-055		ASSEM. REF. NO.		COMPUTER GENERATED DRAWING
DRAWN BY	TEF	12/14/02	PROPERTY OF ASCO POWER TECHNOLOGIES. USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.		SCALE	1:1
CHECKED					SIZE	A
PROJECT APPROVAL					DWG. NO.	FC 1100-20
FINAL APPROVAL	TEF	12/14/02	ASCO® ASCO POWER TECHNOLOGIES, L.P. FLORHAM PARK, NEW JERSEY 07932 U.S.A.		DRAWING REV.	ECN 255410 SHEET 1 OF 1

CR(E) 1s, 1, 3, 5, 10, 15 and 20



TM02.1198.0601 - CR7371 - CR7379

Sectional drawing



TM02.1194.1403

Materials: CR(E)

Pos.	Designation	Materials	AISI/ASTM
1	Pump head	Cast iron	A 48-30 B
3	Shaft	Stainless steel	AISI 316 ¹⁾ AISI 431 ²⁾
4	Impeller	Stainless steel	AISI 304
5	Chamber	Stainless steel	AISI 304
6	Outer sleeve	Stainless steel	AISI 304
7	O-ring for outer sleeve	EPDM or FKM	
8	Base	Cast iron	A 48-30 B
9	Neck ring	PTFE	
10	Shaft seal	Cartridge type	
	Bearing rings	Silicon carbide	
	Rubber parts	EPDM or FKM	

¹⁾ CR(E) 1s, 1, 3, 5

²⁾ CR(E) 10, 15, 20

³⁾ Stainless steel available on request.

⁴⁾ CF 8M is cast equivalent of AISI 316 stainless steel.

⁵⁾ CRI(E)/CRN(E) 1s, 1, 3, 5

⁶⁾ CRN(E) 10, 15, 20

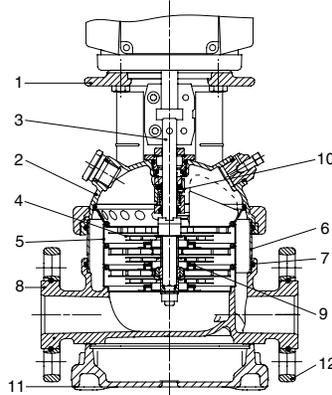
⁷⁾ CRI(E) 10, 15, 20

CRI(E), CRN(E) 1s, 1, 3, 5, 10, 15 and 20



TM02.1808.2001 - GR7373 - GR7375

Sectional drawing



TM03.2156.3805

Materials: CRI(E), CRN(E)

Pos.	Designation	Materials	AISI/ASTM
1	Pump head	Cast iron ³⁾	A 48-30 B
2	Pump head cover	Stainless steel	CF 8M ⁴⁾
3	Shaft	Stainless steel	AISI 316 ⁵⁾ AISI 329 ⁶⁾ AISI 431 ⁷⁾
8	Base	Stainless steel	CF 8M ⁴⁾
9	Neck ring	PTFE	
10	Shaft seal	Cartridge type	
11	Base plate	Cast iron ³⁾	A 48-30 B
	Bearing rings	Silicon carbide	
	Rubber parts	EPDM or FKM	
CRI(E)			
4	Impeller	Stainless steel	AISI 304
5	Chamber	Stainless steel	AISI 304
6	Outer sleeve	Stainless steel	AISI 304
7	O-ring for outer sleeve	EPDM or FKM	
12	FGJ flange ring	Ductile iron ³⁾	A 65-45-12
CRN(E)			
4	Impeller	Stainless steel	AISI 316
5	Chamber	Stainless steel	AISI 316
6	Outer sleeve	Stainless steel	AISI 316
7	O-ring for outer sleeve	EPDM or FKM	
12	FGJ flange ring	Ductile iron ³⁾	A 65-45-12

TEFC motors

(Totally Enclosed Fan Cooled, constant speed)

HP	PH	Frame	S.F.	Voltage [V]	Mtr. Eff. [%]	Insul. class	KVA code	Full load current [A]	Service Factor current [A]	Start current [A]	Motor type
1/3	1	56C	1.35	115/230	55	B	K	6.0/3.0	7.6/3.8	28/14	Baldor
	3	56C	1.35	208-230/460	78.5/80	F	L	1.12-1.1/0.55	1.5-1.45/0.75	7.1-10.2/3.9	ML
1/2	1	56C	1.6	115/208-230	62	B	K	7.4/4.1-3.7	9.8/5.2-4.9	39/21.6-19.5	Baldor
	3	56C	1.25	208-230/460	78/79.5	F	K	1.64-1.55/0.78	2.0-1.9/0.95	9.7-10.1/5.1	ML
3/4	1	56C	1.25	115/208-230	66	B	K	9.6/5.3-4.8	11.4/6.0-5.7	56/31-28	Baldor
	3	56C	1.25	208-230/460	79/80	F	K	2.4-2.3/1.2	2.9-2.75/1.4	14.2-15/7.8	ML
1	1	56C	1.25	115/230	66	B	K	12/6.0	14.4/7.2	77/38.5	Baldor
	3	56C	1.25	208-230/460	81/81	F	J	3.25-3.35/1.68	4.0-3.9/1.95	19.2-21.8/10.9	ML
1 1/2	1	56C	1.3	115/208-230	71	B	K	17/9.5-8.6	20.4/11.3-10.2	106/58.6-53	Baldor
	3	56C	1.15	208-230/460	83/84	F	M	4.7-4.6/2.3	5.2-5.1/2.55	33.8-36.8/18.4	ML
2	1	56C	1.15	115/230	74	F	K	23/11.5	25.4/12.7	156/78	Baldor
	3	56C	1.15	208-230/460	84.5/85.5	F	G	5.7-5.4/2.7	6.55-6.1/3.05	46.2-48.6/24.3	ML
3	1	182TC	1.15	115/208-230	75	F	H	29/16-14.5	31.8/18-15.9	170/94-85	Baldor
	3	182TC	1.15	208-230/460	82.5/84	F	K	8.9-8.5/4.25	10.4-9.5/4.75	60.5-63.8/31.9	ML
5	1	213TC	1.15	208-230	80	F	J	24-22	27-25	188-170	Baldor
	3	184TC	1.15	208-230/460	84.5/86	F	S	14.2-14.0/7.0	16-15.4/7.7	109-119/59.5	ML
7 1/2	1	213TC	1.15	208-230	82	F	F	33.8-31	38.5-35.5	244-220	Baldor
	3	213TC	1.15	208-230/460	86/87.5	F	M	21-21.5/10.8	24-23.5/11.8	162-183/93	ML
10	1	213TC	1.15	230	85.5	F	F	40	46	284	Baldor
	3	213TC	1.15	208-230/460	89/89.5	F	L	28-28.5/14.4	32-31.5/16	241-271/137	ML
15	3	254TC	1.15	208-230/460	86.5	H	L	38-34/17	43.4-39/19.5	376-340/170	Baldor
20	3	254TC	1.15	230/460	88.5	F	K	46/23	52.4/26.2	420/210	Baldor
25	3	284TSC	1.15	230/460	91.7	F	J	57/28.5	66/33	498/249	Baldor
30	3	286TSC	1.15	230/460	91	F	G	68/34	78/39	450/225	Baldor
40	3	286TSC	1.15	230/460	90.2	F	H	90/45	104/52	644/322	Baldor
50	3	326TSC	1.15	230/460	93	F	G	110/55	128/64	746/393	Baldor
60	3	364TSC	1.15	230/460	93	F	G	134/67	154/77	918/459	Baldor



TM02 7696 3803

ML motor



GR 7845

Notes:

- The information in this chart applies to **Grundfos' ML motors and Grundfos specified Baldor® motors.**

ML motors: Three-phase, 0.33-10 hp

Baldor motors: Single-phase, 0.33-10 hp and
Three-phase, 15-60 hp.

Grundfos CR pumps are supplied with heavy-duty 2-pole, NEMA C-frame motors built or selected to our rigid specifications. All CR pump motors have heavy-duty bearings in them for maximum thrust requirements.

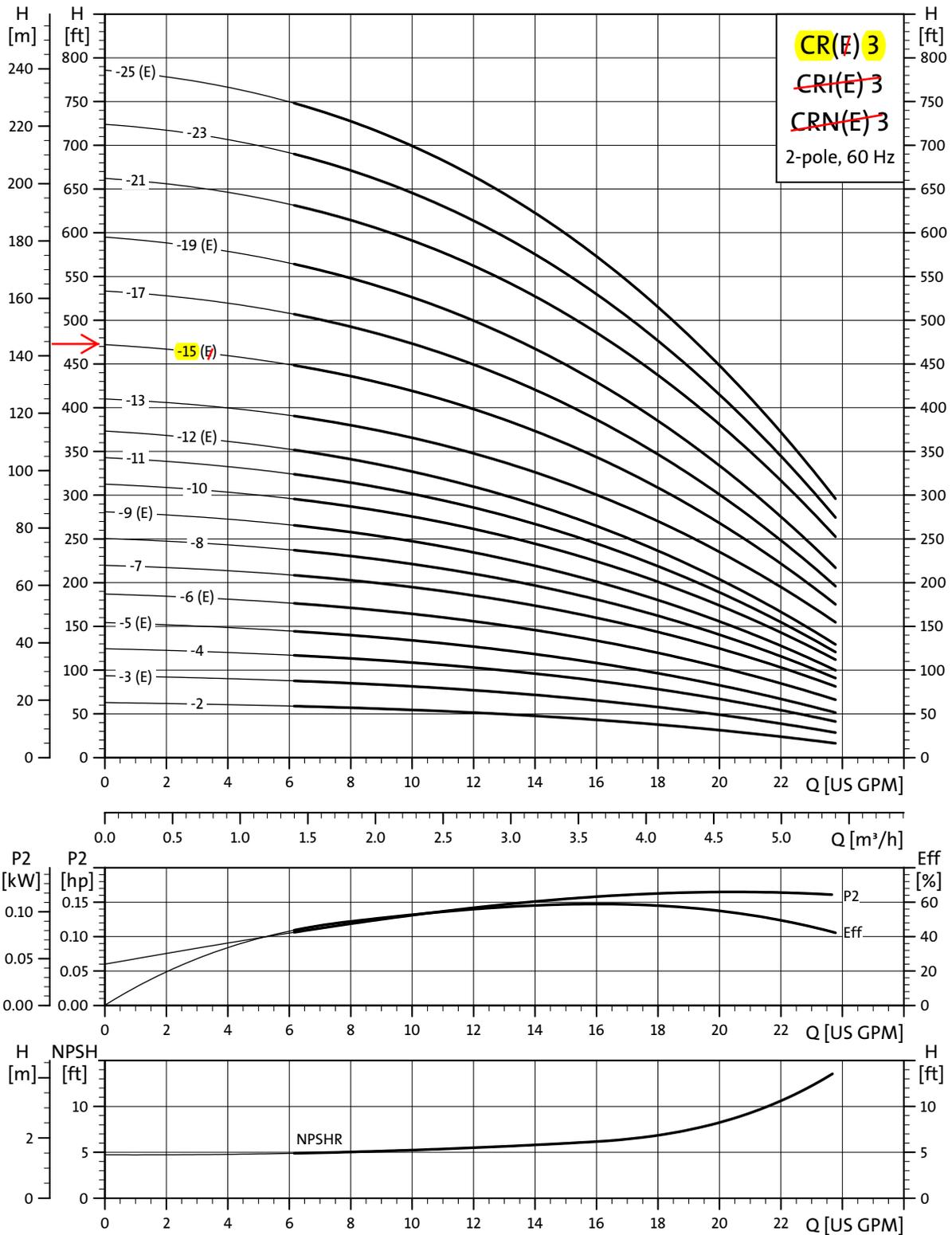
It is not recommended that an off-the-shelf standard Baldor motor be used on a Grundfos pump. Ideally, the best motor choice would be the Grundfos specified motor.

- Other motor types are available (i.e., Explosion proof, Mill and Chem duty, High Efficiency, etc.), consult local Grundfos company for more information.

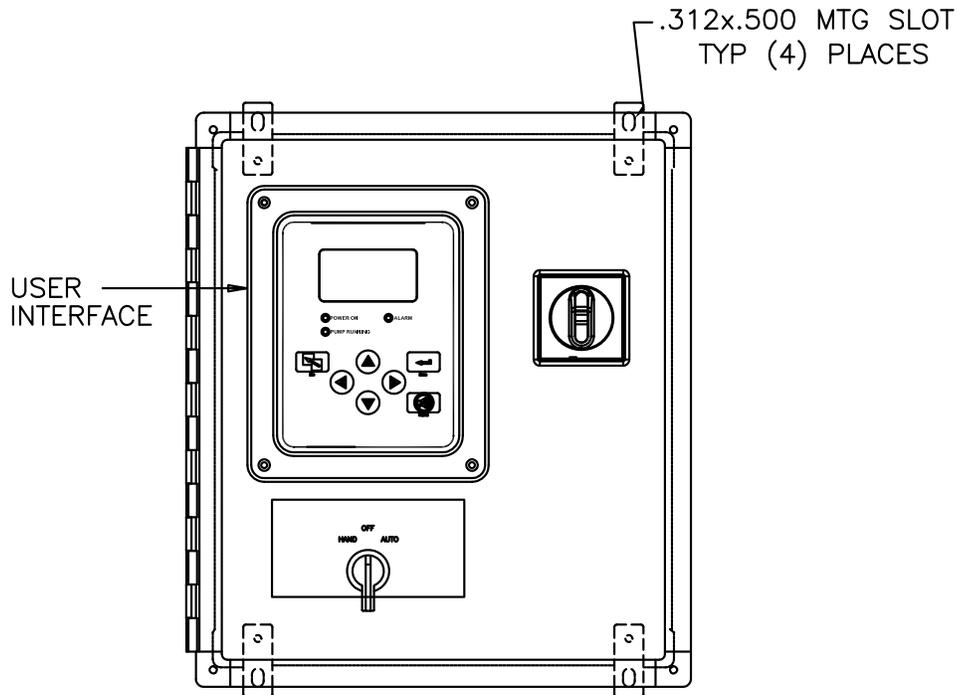
- Pumps supplied by Grundfos Canada are normally supplied with motors from other manufactures. 575 volt motors meet EPart/NRC efficiency standards. Dimensions and data will vary, contact local Grundfos company for more information.
- All values are subject to change without notice.

Performance curves

CR(E) 3, CRI(E) 3, CRN(E) 3



TM02 4084 1303



(DRAWINGS INCLUDED IN THIS PACKAGE ARE FOR STANDARD CONTROLLERS. ACTUAL "AS BUILT" DRAWINGS MAY DIFFER FROM THOSE SEEN HERE).

FTA550F

Firetrol Limited Option JockeyXG Pump Controller

FTA550F - Full Voltage Starting

Specifications

1.0 Main Fire Pump Controller

The auxiliary jockey pump controller, if required and specified on the plans and specifications, shall be factory assembled, wired, and tested and specifically designed for this type of service. This controller shall be of the same manufacturer as the main fire pump controller.

1.1 Standards, Listings & Approvals

The controller shall conform to all the requirements of the latest editions of:
NFPA 70, *National Electrical Code*.

The controller shall be listed by:

Underwriters Laboratories, Inc., in accordance with UL508A, *Standard for Industrial Controls*
Canadian Standards Association CSA-C22.2, *Standard for Industrial Control Equipment (cUL)*

1.2 Enclosure

The controller components shall be housed in a NEMA Type 2/12 (IEC IP22/IP54) polycarbonate, wall mounted enclosure (UL50E Construction).

1.3 Withstand Ratings (Short Circuit Current Ratings)

The jockey shall have standard short circuit current ratings of:

30kA @ 480 Volts Max. (3-Phase)

18kA @ 600 Volts (3-Phase)

5kA @ 240 Volts Max. (1-Phase)

1.4 Construction

The jockey pump controller shall be full voltage starting, rated for wye-connected power systems above 240V. The controller shall incorporate a horsepower rated manual circuit protector and starting contactor, control circuit transformer with 24VAC secondary and 200-600V multi-tap primary, main disconnect switch, HAND-OFF-AUTOMATIC selector switch and a 0-300 psi (0-20.7 bar) stainless steel solid state pressure transducer.

1.5 Operator Interface

The fire pump controller shall feature an operator interface with user keypad. The interface shall monitor and display motor operating conditions, including all alarms, events, and pressure conditions. All alarms, events, and pressure conditions shall be displayed with a time and date stamp. The display shall be a 128x64 Backlit LCD capable of customized graphics. The display and interface shall be NEMA rated for Type 2, 3R, 4, 4X, and 12 protection and shall be fully accessible without opening the controller door. The display and user interface shall utilize multiple levels of password protection for system security. A minimum of 3 password levels shall be provided.

1.6 Digital Status/Alarm Messages

The digital display shall indicate text messages for the status and alarm conditions of:

- Pump Running
- Low System Pressure
- Automatic Start
- Main Switch Position
- Sequential Start Time
- Pump Restart Timer
- System Overpressure
- User Selectable #2¹
- Minimum Run Time
- Fail to Start
- User Selectable #1¹

¹User may choose from the following to be shown on main display (stop pressure setting, start pressure setting, cycles/period, cycles/month, cycles/day, cycles/hour, total cycle count, pump total run time)

The Sequential Start Timer, Minimum Run Timer/Off Delay Timer and Pump Restart Timer shall be displayed as numeric values reflecting the value of the remaining time.

1.7 LED Visual Indicators

LED indicators, visible with the door closed, shall indicate:

- Power ON
- Alarm
- Pump Running

1.8 Event Recording

Memory - The controller shall record all operational and alarm events to system memory. All events shall be time and date stamped and include an index number. The system memory shall have the capability of storing 3000 events and allow the user access to the event log via the user interface. The user shall have the ability to scroll through the stored messages in groups of 1 or 10.

1.9 Serial Communications

The controller shall feature a RS485 serial communications port for use with 2 or 4 wire Modbus RTU communications.

2.0 Solid State Pressure Transducer

The controller shall be supplied with a solid state pressure transducer with a range of 0-300 psi (0-20.7 bar) ± 1 psi. The solid state pressure switch shall be used for both display of the system pressure and control of the fire pump controller. Systems using analog pressure devices or mercury switches for operational control will not be accepted.

The START, STOP and SYSTEM PRESSURE shall be digitally displayed and adjustable through the user interface. The pressure transducer shall be mounted inside the controller to prevent accidental damage. The pressure transducer shall be directly pipe mounted to a bulkhead pipe coupling without any other supporting members. Field connections shall be made externally at the controller coupling to prevent distortion of the pressure switch element and mechanism.

2.1 Seismic Certification

The controller shall be certified to meet or exceed the requirements of the 2006 International Building Code and the 2010 California Building Code for Importance Factor 1.5 Electrical Equipment for Sds equal to 1.88 or less severe seismic regions. Qualifications shall be based upon successful tri-axial shake-table testing in accordance with ICC-ES AC-156. Certification without testing shall be unacceptable. Controller shall be clearly labeled as rated for installation in seismic areas and a Certificate of Conformance shall be provided with the controller.

NOTE: Not available on Model FTA1500 Controllers

2.2 Controller Operation

A digitally set On Delay (Sequential Start) timer shall be provided as standard. Upon a call to start, the user interface shall display a message indicating the remaining time value of the On Delay timer.

The controller shall include a Minimum Run Timer to allow the motor to run for a set period of timer after starting. The timer shall be programmable through the user interface.

A pump restart delay timer shall be provided to allow the residual voltage of the motor to decay prior to restarting the motor and to prevent severe short cycling of the motor. The timer shall be programmable through the user interface.

A Lamp Test feature shall be included. The user interface shall also have the ability to display the status of the system inputs and outputs.

An Audible Test feature shall be included to test the operation of the audible alarm device (if supplied).

The disconnect switch shall be mechanically interlocked so that the enclosure door cannot be opened with the handle in the ON position except by a hidden tool operated defeater mechanism. The disconnect switch shall be capable of being padlocked in the OFF position for installation and maintenance safety.

2.3 Manufacturer

The controller shall be a Firetrol brand.

111 Corning Road
Suite 120
Cary, North Carolina 27518
P +1 919 460 5200
F +1 919 460 5250
www.firetrol.com

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ASCO Power
Technologies®

Publication SP550F-01 Rev. D

Firetrol®

Limited Option JockeyxG Pump Controller

FTA550F
Product Description



Description—Firetrol® FTA550F XG Jockey Pump Controllers are intended for use with fire pump systems. They are used for pressure maintenance in fire pump installations to prevent unnecessary operation of the main fire pump.

Approvals—Firetrol jockey pump controllers are listed by Underwriters’ Laboratories, Inc., in accordance with UL508A, Standard for Industrial Controls, and CSA, Standard for Industrial Control Equipment. They are built to meet or exceed the requirements of the approving authorities as well as NEMA and the latest edition NFPA 70, National Electrical Code.

Standard Features—The following are included as standard with each controller:

- NEMA Type 2/12 (IEC IP22/IP54) Polycarbonate enclosure (UL50E Construction)
- Horsepower rated motor circuit protector and starting contactor
- Suitable for use as service equipment
- HAND-OFF-AUTO selector switch
- Minimum run timer
- On-Delay timer
- Pump Restart Timer
- Control circuit transformer with 24VAC secondary
- 0-300 psi (0-20.7 bar) stainless steel solid state pressure transducer
- Overpressure indication

- Low Pressure indication
- Failed to start indication
- Main switch not in “Auto” alarm
- Pressure recording
- Event log (3000 events stored in controller memory)
- Data log (including cycle counter)
- Door mounted display/user interface featuring a 128 x 64 pixel backlit LCD Graphical Display, Membrane Type User Controller Push-buttons and LED indication for:
 - Power ON
 - Pump Running
 - Alarm
- 2 lines of user selectable display information

NOTE: FTA550F XG Jockey Pump Controllers are only available in the voltage/horsepower combinations shown below and with the options shown on the reverse side. For other combinations and options, see documentation for FTA550E series XG Jockey Pump Controllers.

	VOLTAGE 3-PHASE (50/60 Hertz)	MAX HP (MCP)	Short Circuit Current Rating
-H	200-208	7.5	30kA
-A	220-240	10	30kA
-F	380-415V - WYE	15	30kA
-B	440-480V - WYE	20	30kA
-C	550-600V - WYE	20	18kA
	VOLTAGE 1-PHASE (50/60 Hertz)	MAX HP (MCP)	Short Circuit Current Rating
-D	110-120 Volts	2	5kA
-T	200-208 Volts	3	5kA
-E	220-240 Volts	5	5kA

NOTE: Firetrol Brand Jockey Pump controllers DO NOT CONTAIN MERCURY filled pressure switches.

OPTIONS & MODIFICATIONS

SPECIAL ENCLOSURES

- E Enclosure, NEMA Type 4 (IP66)*
- F Enclosure, NEMA Type 4X (IP66)*
- T Enclosure, NEMA Type 3R (IP24)*

* Supplied with non-metallic enclosure

ANTI-CONDENSATION SPACE HEATERS¹

- J Space Heater, 120V Externally Powered with Circuit Breaker and Thermostat
- K Space Heater, 120V Externally Powered with Circuit Breaker and Humidistat
- M Space Heater, 240V Externally Powered with Circuit Breaker and Thermostat
- N Space Heater, 240V Externally Powered with Circuit Breaker and Humidistat

¹ Power source supplied by others

PRESSURE TRANSDUCERS

- B Wetted Parts Including Pressure Sensor, 600 PSI (42 Bar), Fresh Water
- C Wetted Parts Including Pressure Sensor, 300 PSI (21 Bar), Sea Water
- D Wetted Parts Including Pressure Sensor, 600 PSI (42 Bar), Sea Water

MISCELLANEOUS

- AC Alarm Output Contacts, Pump Operating (2 Sets)
- AM Alarm Output Contacts, Fail To Start
- AST Input Terminals, Automatic Start
- BW Alarm Output Contacts, Phase Failure/Phase Reversal

- BY Alarm Output Contacts, Pump Overload
- EF Alarm Output Contacts, Main Switch Not In Auto (1 Set)
- HV Alarm, Audible
- IECI Marking, CE With Internal Wet Parts
- KH Alarm Output Contacts, Common Alarm
- NZ Input Terminals, Shutdown Interlock
- OSP Marking, OSHPD Seismic Certification (State of California) (Requires option -SEI)
- S Tropicalization
- SEI Marking, Seismic Certified
- ZPA Scheduled Service Message
- ZPJ Data Port, Serial Modbus RTU Over 2-Wire or 4-Wire RS485

* Export Packaging available for additional cost

NOTE: For requirements not listed here (higher short circuit ratings, larger horsepower, options not listed...etc) please refer to documentation for FTA550E series Jockey Pump Controllers.

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FTA550F JOCKEYxg PUMP CONTROLLERS

FTA550F-A G - (Example: FTA550F-AG015B-T-BY)

FTA NUMBER
FTA550F

TIMER OPTION
-A With Programmable Running Period Timer

MOTOR CURRENT PROTECTION
-G Manual Motor Protector
Suitable for Use as Service Equipment
Short Circuit Current Rating
3 Phase --200-480V - 30kA /600V - 18kA
1 Phase -- 110-240V - 5kA

HORSEPOWER (KW)

014 - 1/4 HP (.18)	004 - 4 HP (3)
013 - 1/3 HP (.23)	005 - 5 HP (3.7)
012 - 1/2 HP (.37)	006 - 5 1/2 HP (4)
034 - 3/4 HP (.56)	007 - 7 1/2 HP (5.5)
001 - 1 HP (.75)	010 - 10 HP (7.5)
011 - 1 1/2 HP (1.1)	015 - 15 HP (11)
002 - 2 HP (1.5)	020 - 20 HP (15)
003 - 3 HP (2.2)	

(See Voltage Selection for Maximum HP/Voltage Combinations)

OPTIONS & MODIFICATIONS
(See other side)

VOLTAGE 3-PHASE (50/60 Hertz)	MAX HP
-H 200-208 Volts	7.5
-A 220-240 Volts	10
-F 380-415V - WYE	15
-B 440-480V - WYE	20
-C 550-600V - WYE	20

VOLTAGE 1-PHASE (50/60 Hertz)	MAX HP
-D 110-120 Volts	2
-T 200-208 Volts	3
-E 220-240 Volts	3

NOTE: For requirements not listed here (higher short circuit ratings, larger horsepowers, options not listed...etc) please refer to documentation for FTA550E series Jockey Pump Controllers.

OPTIONS & MODIFICATIONS

SPECIAL ENCLOSURES

- E Enclosure, NEMA Type 4 (IP66) *
- F Enclosure, NEMA Type 4X (IP66) *
- T Enclosure, NEMA Type 3R (IP24) *

* Supplied with non-metallic enclosure

ANTI-CONDENSATION SPACE HEATERS¹

- J Space Heater, 120V Externally Powered with Circuit Breaker and Thermostat
- K Space Heater, 120V Externally Powered with Circuit Breaker and Humidistat
- M Space Heater, 240V Externally Powered with Circuit Breaker and Thermostat
- N Space Heater, 240V Externally Powered with Circuit Breaker and Humidistat

¹ Power source supplied by others

PRESSURE TRANSDUCERS

- B Wetted Parts Including Pressure Sensor, 600 PSI (42 Bar), Fresh Water
- C Wetted Parts Including Pressure Sensor, 300 PSI (21 Bar), Sea Water
- D Wetted Parts Including Pressure Sensor, 600 PSI (42 Bar), Sea Water

MISCELLANEOUS

- AC Alarm Output Contacts, Pump Operating (2 Sets)
- AM Alarm Output Contacts, Fail To Start
- AST Input Terminals, Automatic Start

- BW Alarm Output Contacts, Phase Failure/Phase Reversal
- BY Alarm Output Contacts, Pump Overload
- EF Alarm Output Contacts, Main Switch Not In Auto (1 Set)
- HV Alarm, Audible
- IECI Marking, CE With Internal Wet Parts
- KH Alarm Output Contacts, Common Alarm
- NZ Input Terminals, Shutdown Interlock
- OSP Marking, OSHPD Seismic Certification (State of California) (Requires option -SEI)
- S Tropicalization
- SEI Marking, Seismic Certified
- ZPA Scheduled Service Message
- ZPJ Data Port, Serial Modbus RTU Over 2-Wire or 4-Wire RS485

* Export Packaging available for additional cost

NOTE: For requirements not listed here (higher short circuit ratings, larger horsepowers, options not listed...etc) please refer to documentation for FTA550E series Jockey Pump Controllers.

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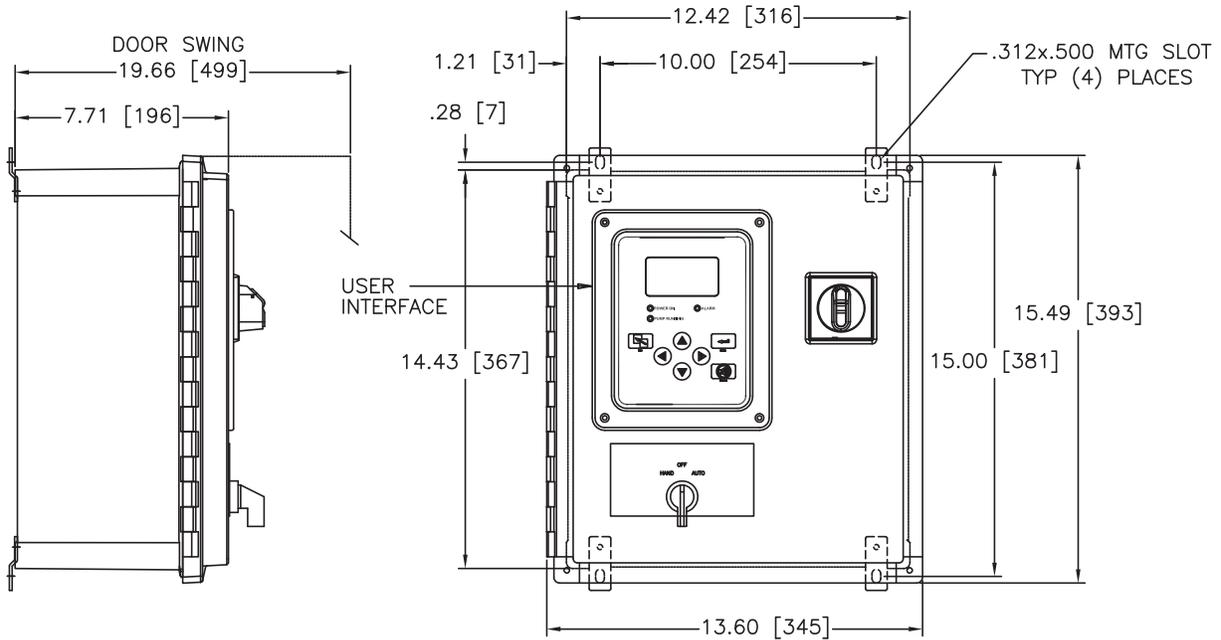
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Limited Option Jockeyxg Pump Controller

FTA550F
Dimensional Drawing



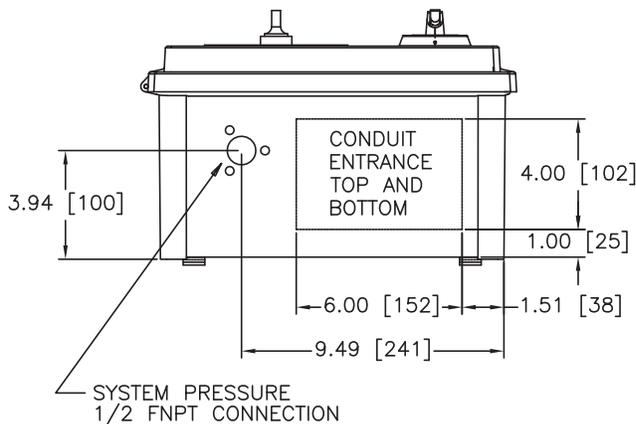
NOTE

CONDUIT ENTRANCE TOP AND BOTTOM ONLY DO NOT ENTER FROM SIDES.

CAUTION

BONDING BETWEEN CONDUIT CONNECTIONS IS NOT AUTOMATIC AND MUST BE PROVIDED AS PART OF THE INSTALLATION.

DIMENSIONS SHOWN ON THIS DRAWING ARE APPLICABLE FOR NEMA TYPES 2/3R/4/4X/12



SHIPPING WEIGHT
APPROX. 15 [6.8]

MAXIMUM MOTOR HORSEPOWER				
200-208V	220-240V	380-415V	440-480V	550-600V
7 1/2	10	15	20	20

ALL DIMENSIONS - INCHES [MM]
SHIPPING WEIGHT - POUNDS [KG]

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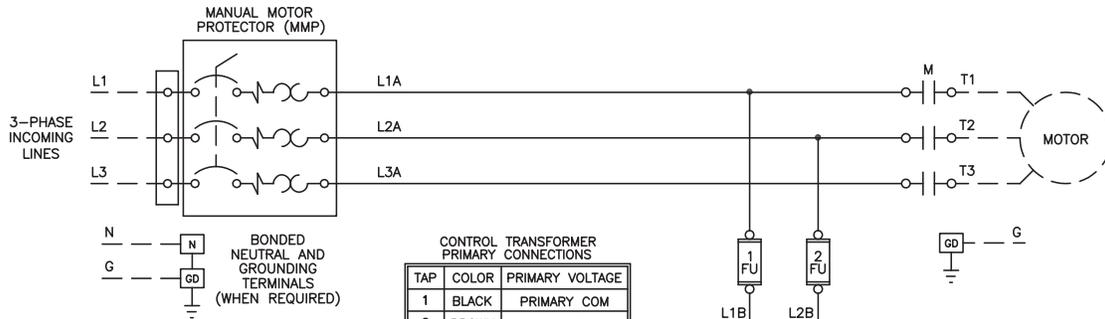
PROJECT NAME:				REV. TO SHEET	ECN NO.	BY	APP.	DATE
Dimensions and Shipping Weight				FTA550F				
JOCKEY XG PUMP CONTROLLER (POLYCARBONATE)								
			MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-055			ASSEM. REF. NO.		
DRAWN BY			DATE			COMPUTER GENERATED DRAWING		
CHECKED			PROJECT APPROVAL			SCALE 1:1 SIZE A		
FINAL APPROVAL			DATE			DWG. NO.		
TEF			02/29/12			DD550-01		
			PROPERTY OF ASCO POWER TECHNOLOGIES. USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.			DRAWING REV. -		
			ASCO® ASCO POWER TECHNOLOGIES, L.P. FLORHAM PARK, NEW JERSEY 07932 U.S.A.			ECN NO. 236029 SHEET 1 OF 1		



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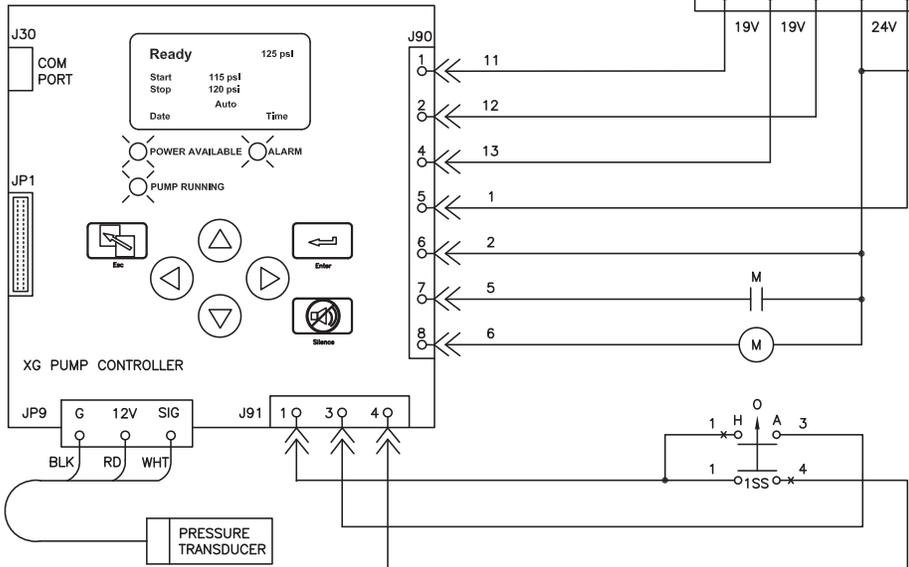
Limited Option Jockeyxg Pump Controller

FTA550F
3 Phase
Wiring Schematic



CAUTION
BONDING BETWEEN CONDUIT CONNECTIONS IS NOT AUTOMATIC AND MUST BE PROVIDED AS PART OF THE INSTALLATION.

TAP	COLOR	PRIMARY VOLTAGE
1	BLACK	PRIMARY COM
2	BROWN	200-208VAC
3	YELLOW	220-240VAC
4	BLUE	380-415VAC
5	PURPLE	440-480VAC
6	GRAY	550-600VAC



NEUTRAL AND GROUND TERMINALS WIRE CAPACITY (CU)
#14 AWG-#6 AWG
2.5 MM²-16 MM²

PRESSURE SYSTEM CONNECTION
1/2" FNPT

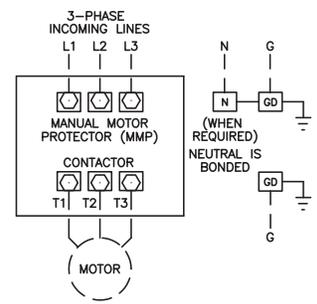
LINE TERMINALS-WIRE CAPACITY (CU)

MAXIMUM MOTOR HORSEPOWER					WIRE SIZE COPPER ONLY
200-208V	220-240V	380-415V	440-480V	550-600V	
7 1/2	10	15	20	20	#10 AWG-#4 AWG 6 MM ² -25 MM ²

MOTOR TERMINALS-WIRE CAPACITY (CU)

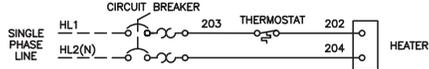
MAXIMUM MOTOR HORSEPOWER					WIRE SIZE COPPER ONLY
200-208V	220-240V	380-415V	440-480V	550-600V	
7 1/2	10	15	20	20	#14 AWG-#8 AWG 2.5 MM ² -10 MM ²

1 FOR CORRECT WIRE SIZING, REFER TO NATIONAL ELECTRICAL CODE, NFPA 70.

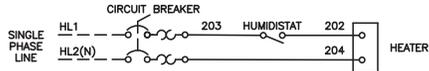


PROJECT NAME:		REV. TO SHEET	ECN NO.	BY	APP.	DATE
WIRING SCHEMATIC		FTA550F				
JOCKEY XG PUMP CONTROLLER WITH MANUAL MOTOR PROTECTOR						
DRAWN BY: TEF		DATE: 02/27/12	MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-055	ASSEM. REF. NO.		COMPUTER GENERATED DRAWING
CHECKED			PROPERTY OF ASCO POWER TECHNOLOGIES. USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.	SCALE: 1:1	SIZE: A	
PROJECT APPROVAL				DWG. NO. WS550-01		
FINAL APPROVAL	TEF	02/29/12	ASCO ASCO POWER TECHNOLOGIES, L.P. FLORHAM PARK, NEW JERSEY 07932 U.S.A.	DRAWING REV.	ECN NO. 236029	SHEET 1 OF 1

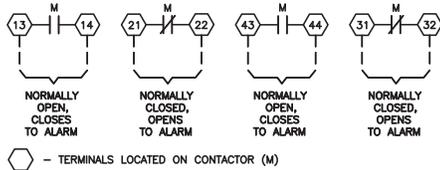
- MODIFICATION J - SPACE HEATER, 110-120VAC (WITH THERMOSTAT)
- MODIFICATION M - SPACE HEATER, 220-240VAC (WITH THERMOSTAT)



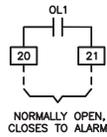
- MODIFICATION K - SPACE HEATER, 110-120VAC (WITH HUMIDISTAT)
- MODIFICATION N - SPACE HEATER, 220-240VAC (WITH HUMIDISTAT)



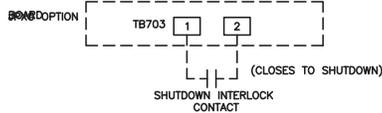
- MODIFICATION AC - PUMP OPERATING ALARM CONTACTS



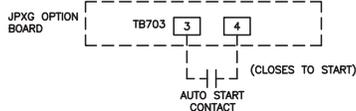
- MODIFICATION BY - PUMP OVERLOAD REMOTE ALARM CONTACT



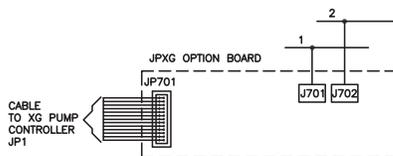
- MODIFICATION NZ - INTERLOCK SHUTDOWN IN AUTO



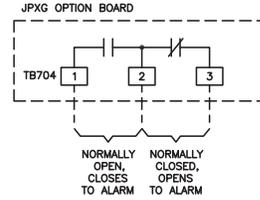
- MODIFICATION AST - REMOTE AUTO START INPUT



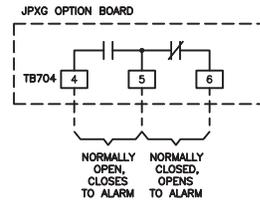
WIRING REQUIRED WHEN JPXG OPTION BOARD IS USED



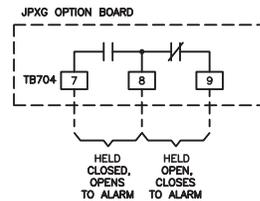
- MODIFICATION AM - PUMP FAILED TO START REMOTE ALARM CONTACTS



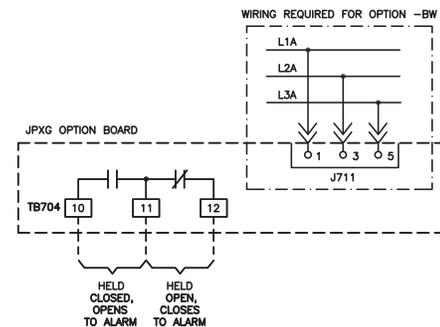
- MODIFICATION EF - SWITCH NOT IN AUTO REMOTE ALARM CONTACTS



- MODIFICATION KH - COMMON TROUBLE REMOTE ALARM CONTACTS



- MODIFICATION BW - PHASE FAILURE/REVERSAL REMOTE ALARM CONTACTS



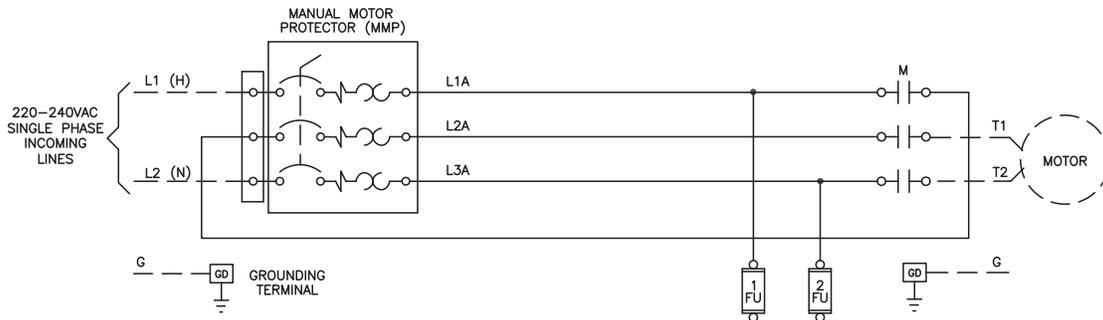
CONTROL AND ALARM TERMINAL WIRE CAPACITY	
JPXG OPTION BOARD TERMINALS	#18-12 AWG [75-4 MM ²]
PUMP OPERATING TERMINALS	#18-14 AWG [75-2.5 MM ²]
CIRCUIT BREAKERS	#14-4 AWG [2.5-25 MM ²]

PROJECT NAME:				REV. TO SHEET	ECN NO.	BY	APP.	DATE
WIRING SCHEMATIC				FTA550F		THIRD ANGLE PROJECTION		
JOCKEY XG PUMP CONTROLLER WITH MANUAL MOTOR PROTECTOR								
OPTIONS AND MODIFICATIONS								
DRAWN BY	TEF	DATE	02/27/12	MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-055		ASSEM. REF. NO.		COMPUTER GENERATED DRAWING
CHECKED				PROPERTY OF ASCO POWER TECHNOLOGIES. USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.				SCALE 1:1
PROJECT APPROVAL				ASCO® ASCO POWER TECHNOLOGIES, L.P. FLORHAM PARK, NEW JERSEY 07932 U.S.A.				SIZE A
FINAL APPROVAL	TEF	DATE	02/29/12					DWG. NO. WS550-02
						DRAWING REV. -		ECN NO. 236029
								SHEET 1 OF 1

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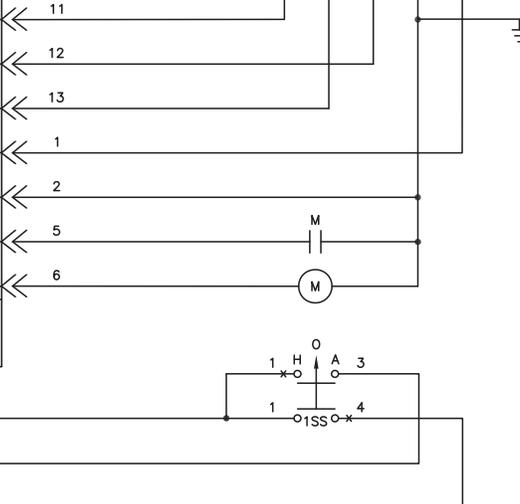
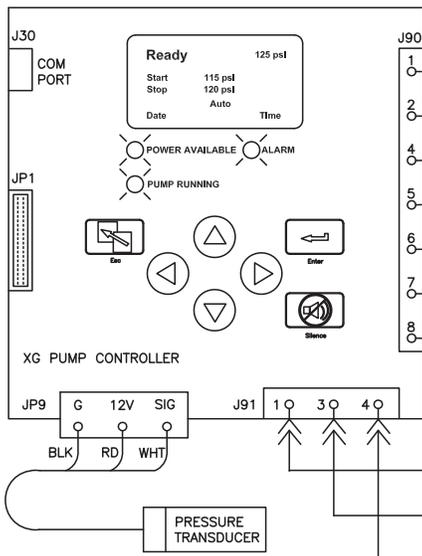
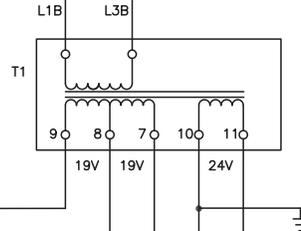
Limited Option Jockeyxg Pump Controller

FTA550F
220-240V - 1 Phase
Wiring Schematic



CAUTION
BONDING BETWEEN CONDUIT CONNECTIONS IS NOT AUTOMATIC AND MUST BE PROVIDED AS PART OF THE INSTALLATION.

TAP	COLOR	PRIMARY VOLTAGE
1	BLACK	PRIMARY COM
3	YELLOW	220-240VAC



GROUND TERMINALS WIRE CAPACITY (CU)
#14 AWG-#6 AWG
2.5 MM²-16 MM²

PRESSURE SYSTEM CONNECTION
1/2" FNPT

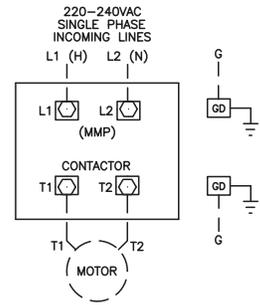
LINE TERMINALS-WIRE CAPACITY (CU) ¹

MAXIMUM MOTOR HORSEPOWER	WIRE SIZE COPPER ONLY
220-240V	
5	#10 AWG-#4 AWG 6 MM ² -25 MM ²

MOTOR TERMINALS-WIRE CAPACITY (CU) ¹

MAXIMUM MOTOR HORSEPOWER	WIRE SIZE COPPER ONLY
220-240V	
5	#14 AWG-#8 AWG 2.5 MM ² -10 MM ²

¹ FOR CORRECT WIRE SIZING, REFER TO NATIONAL ELECTRICAL CODE, NFPA 70.

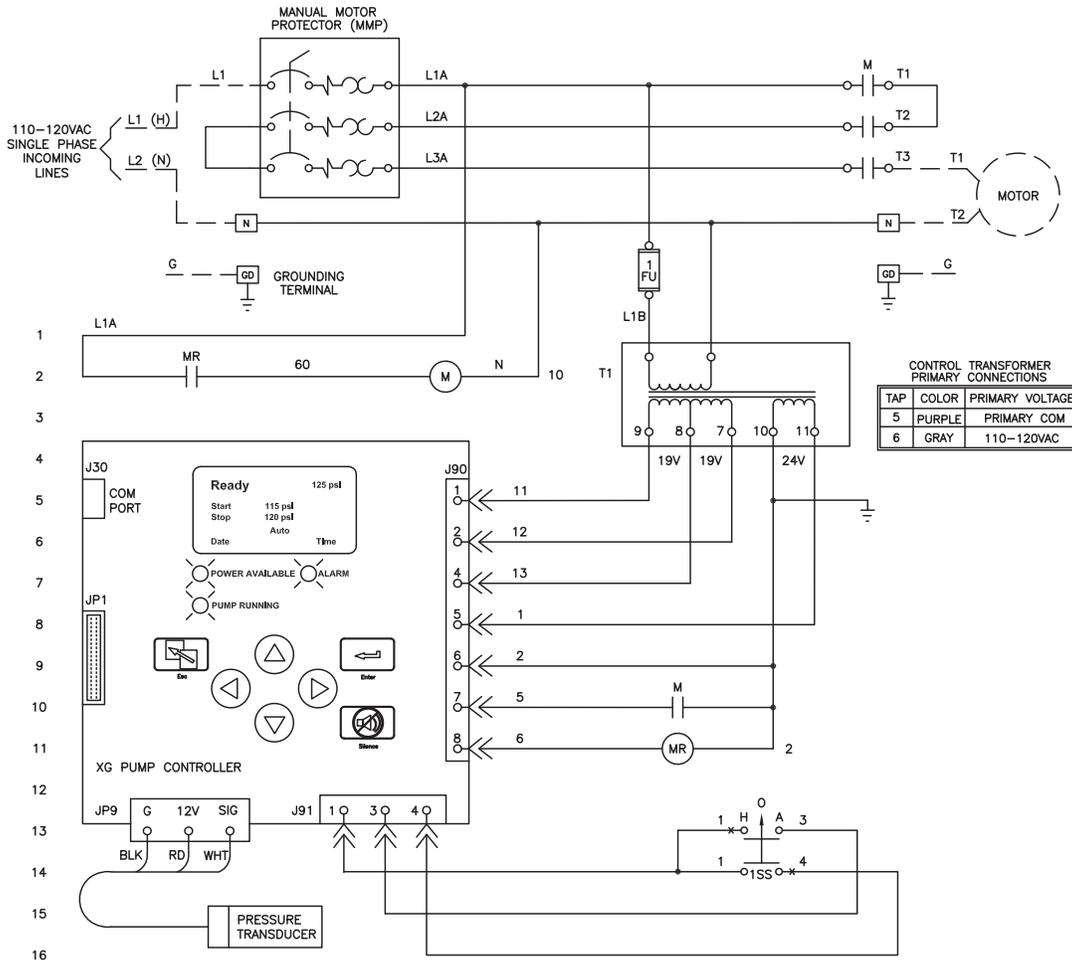


SEE ECN	B	239104	TEF	TEF	09/25/12
SEE ECN	A	239050	TEF	TEF	09/20/12
PROJECT NAME:			REV. TO SHEET	ECN NO.	BY
WIRING SCHEMATIC			FTA550F		
SINGLE PHASE JOCKEY XG PUMP CONTROLLER WITH MANUAL MOTOR PROTECTOR (220-240VAC)			THIRD ANGLE PROJECTION		
DRAWN BY	TEF	DATE	08/22/12	MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-055.	
CHECKED		PROJECT APPROVAL	TEF	08/22/12	ASSEM. REF. NO.
FINAL APPROVAL	TEF	DATE	08/22/12	PROPERTY OF ASCO POWER TECHNOLOGIES. USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.	
COMPUTER GENERATED DRAWING			SCALE	1:1	SIZE
DRAWING NO.			A		
DRAWING REV.			B		
ECN NO.			239104		
SHEET 1 OF 1			WS550-13		

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Limited Option Jockeyxg Pump Controller

FTA550F
110-120V - 1 Phase
Wiring Schematic



CONTROL TRANSFORMER PRIMARY CONNECTIONS

TAP	COLOR	PRIMARY VOLTAGE
5	PURPLE	PRIMARY COM
6	GRAY	110-120VAC

GROUND TERMINALS WIRE CAPACITY (CU)

#14 AWG-#6 AWG	2.5 MM ² -16 MM ²
----------------	---

PRESSURE SYSTEM CONNECTION

1/2" FNPT

CAUTION
BONDING BETWEEN CONDUIT CONNECTIONS IS NOT AUTOMATIC AND MUST BE PROVIDED AS PART OF THE INSTALLATION.

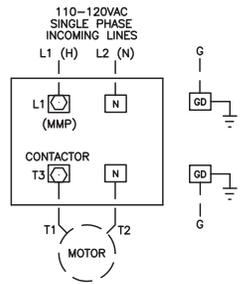
LINE TERMINALS-WIRE CAPACITY (CU) ①

MAXIMUM MOTOR HORSEPOWER	WIRE SIZE COPPER ONLY	NEUTRAL WIRE SIZE COPPER ONLY
110-120V		
1	#14 AWG-#12 AWG 2.5 MM ² -4 MM ²	#14 AWG-#8 AWG 2.5 MM ² -10 MM ²
2	#12 AWG-#8 AWG 4 MM ² -10 MM ²	#14 AWG-#8 AWG 2.5 MM ² -10 MM ²

MOTOR TERMINALS-WIRE CAPACITY (CU) ①

MAXIMUM MOTOR HORSEPOWER	WIRE SIZE COPPER ONLY	NEUTRAL WIRE SIZE COPPER ONLY
110-120V		
2	#14 AWG-#8 AWG 2.5 MM ² -10 MM ²	#14 AWG-#8 AWG 2.5 MM ² -10 MM ²

① FOR CORRECT WIRE SIZING, REFER TO NATIONAL ELECTRICAL CODE, NFPA 70.



PROJECT NAME:		REV. TO SHEET	ECN NO.	BY	APP.	DATE
WIRING SCHEMATIC		FTA550F		THIRD ANGLE PROJECTION		
SINGLE PHASE JOCKEY XG PUMP CONTROLLER WITH MANUAL MOTOR PROTECTOR						
BY	DATE	MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-055		ASSEM. REF. NO.		COMPUTER GENERATED DRAWING
DRAWN BY	TEF	09/11/12				
CHECKED			PROPERTY OF ASCO POWER TECHNOLOGIES. USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.			
PROJECT APPROVAL			SCALE 1:1 SIZE A			
FINAL APPROVAL	TEF	09/12/12	ASCO® ASCO POWER TECHNOLOGIES, L.P. FLORHAM PARK, NEW JERSEY 07932 U.S.A.		DWG. NO. WS550-109	
			DRAWING REV. -		ECN NO. 238858 SHEET 1 OF 1	



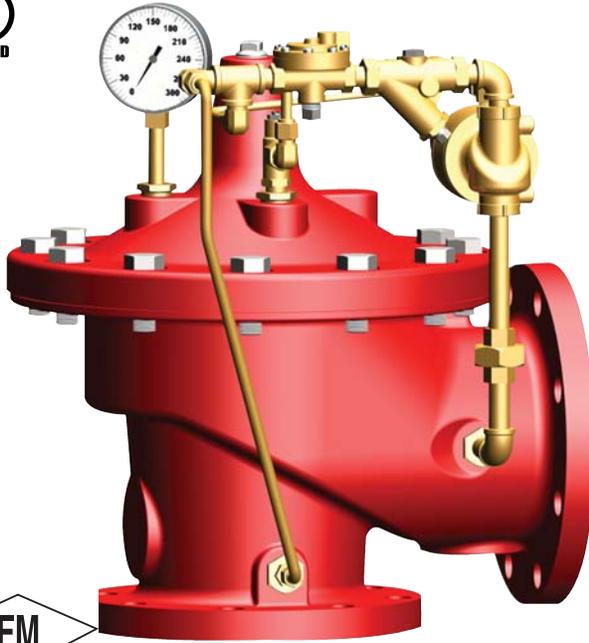
MODEL

50B-4KG1 Globe 2050B-4KG1 Angle

Fire Protection Pressure Relief Valve



- U.L. Listed / U.L.C. Listed
- Factory Mutual Approved
- Fast Opening to Maintain Steady Line Pressure
- Accommodates Wide Range of Flow Rates
- Closes Gradually for Surge-Free Operation
- Adjustable Pressure Settings, Not Affected by Pressure At Valve Discharge

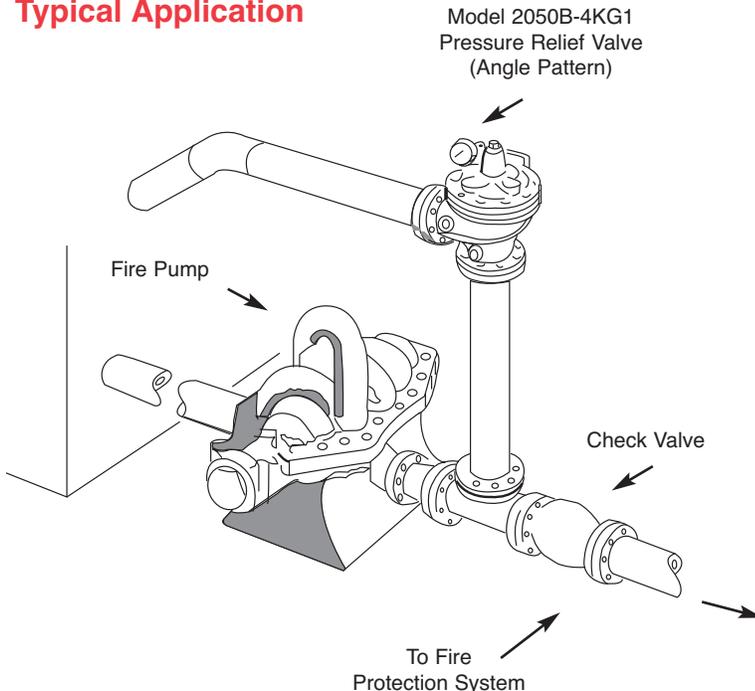


2050B-4KG1 (Angle)

The Cla-Val Model 50B-4KG1 Globe / 2050B-4KG1 Angle Pressure Relief Valve is designed specifically to automatically relieve excess pressure in fire protection pumping systems. Pilot controlled, it maintains constant system pressure at the pump discharge within very close limits as demands change. The 50B-4KG1 and 2050B-4KG1 can be supplied with optional internal and external epoxy coating of the main valve wetted surfaces.

U.L. Listed.....Sizes 3" thru 8"
F.M. Approved.....Sizes 3" thru 8"
U.L.C. Listed.....Sizes 2" thru 10"

Typical Application



Operation Sequence

At pump start, Cla-Val Relief Valve modulates to relieve excess pump capacity, maintaining positive system pressure at the pump discharge.

When fire demand slows or ceases, Cla-Val Model 50B-4KG1 opens, diverting entire pump output to discharge, allowing fire pump to be stopped without causing surging in the lines.

(Please note that if the Model 50B-4KG1 is to be used on a continuous duty basis to maintain fire-system pressure, suitable back pressure must be provided on the valve to prevent cavitation damage. Consult the factory for details.)

"Fluid Control at It's Best"



Specifications

Sizes *Globe:* 2" - 12" flanged
Angle: 2" - 12" flanged

End Details 150 and 300 ANSI B16.42

Pressure Ratings class - 175 psi Max.
class - 300 psi Max.
Water, to 180°F Max.

Materials **Main Valve Body & Cover**
Ductile Iron ASTM A-536
Naval Bronze ASTM B61
Other Material Available
Standard Main Valve Trim:
Bronze Seat, Teflon Coated
Stainless Steel Stem, Delrin Sleeved
Standard Pilot Control System:
Cast Bronze with
Stainless Steel trim

Adjustment Range Available in the following relief pressure ranges:
20-200 psi (150 Class)
100-300 psi (300 Class)

Optional Protective epoxy resin coating of wetted surfaces of main valve cast iron components (UL listed HNFx EX2855)

Purchase Specifications

The Fire Pump Pressure Relief Valve shall modulate to relieve excess pressure in a fire protection system. It shall maintain constant pressure in the system regardless of demand changes. It shall be pilot controlled and back pressure shall not affect its set point. It shall be actuated by line pressure through a pilot control system and open fast in order to maintain steady system pressure as system demand decreases. It shall close gradually to control surges and shall re-seat drip-tight within 5% of its pressure setting. The main valve shall be of the hydraulically-operated, pilot-controlled, diaphragm-type, globe or angle valve. It shall have a single, removable, teflon-coated seat, a grooved stem guided at both ends, and a resilient disc with a rectangular cross section, being contained on 3 1/2 sides. No external packing glands shall be permitted and the diaphragm shall not be used as a seating surface. The pilot control shall be a direct-acting, adjustable, spring-loaded, diaphragm-type valve designed for modulating service to permit flow when controlling pressure exceeds spring setting. This valve shall be UL Listed and Factory Mutual approved. It shall be the Model 50B-4KG1 (globe) or Model 2050B-4KG1 (angle) Pressure Relief Valve as manufactured by Cla-Val Newport Beach, California.

*Special Note:

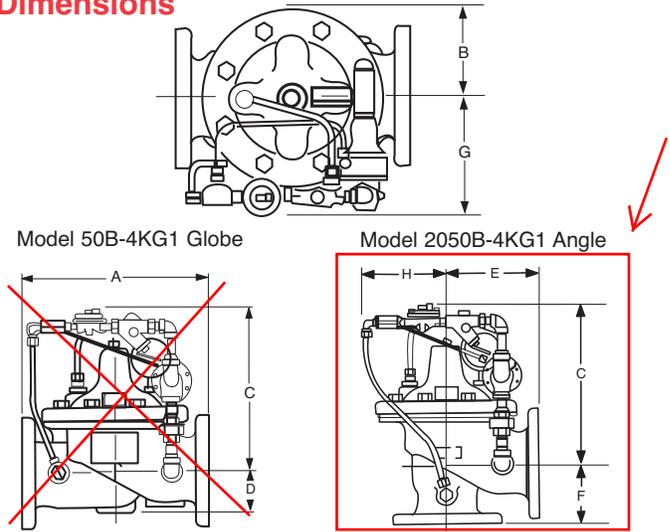
The Model 50B-4KG1 Pressure Relief Valve is available with 300# ANSI inlet flange and 150# ANSI outlet flange. This valve is used on higher pressure systems where 300# flange connections are required, and allows for adapting of a discharge cone (generally supplied with 150# flange) to accommodate "atmospheric break" at relief valve discharge. This relief valve, with 300# / 150# flanges is available on special order, and is UNDERWRITERS LABORATORIES LISTED AND FACTORY MUTUAL APPROVED.

Specifications Seawater Service Option

Sizes *Globe:* 2" - 10" flanged
Angle: 2" - 10" flanged

Consult factory for materials and flange ratings.

Dimensions



We recommend providing adequate space around valve for maintenance work.

Valve Size (inches)	2"	2 1/2"	3"	4"	6"	8"	10"	12"
Threaded Ends	9.38	11.00	12.50	--	--	--	--	--
A 150 Flanged	9.38	11.00	12.00	15.00	20.00	25.38	29.75	34.00
300 Flanged	10.00	11.62	13.25	15.62	21.00	26.38	31.12	35.50
300 x 150			12.88	15.31	20.56	25.88	30.44	34.75
B	3.31	4.00	4.56	5.75	7.88	10.00	11.81	14.00
C	12.00	12.25	12.50	13.00	14.31	16.31	18.00	20.56
D	1.50	1.69	2.56	3.19	4.31	5.31	9.25	10.75
Threaded Ends	4.75	5.50	6.25	--	--	--	--	--
E 150 Flanged	4.75	5.50	6.00	7.50	10.00	12.75	14.88	17.00
300 Flanged	5.00	5.88	6.38	7.88	10.50	13.25	15.56	17.75
Threaded Ends	3.25	4.00	4.50	--	--	--	--	--
F 150 Flanged	3.25	4.00	4.00	5.00	6.00	8.00	8.62	13.75
300 Flanged	3.50	4.31	4.38	5.31	6.50	8.50	9.31	14.50
G & H	6.00	6.69	7.75	7.88	8.50	9.75	13.25	14.25

Valve Size (mm)	50	65	80	100	150	200	250	300
Threaded Ends	238	279	318	--	--	--	--	--
A 150 Flanged	238	279	305	381	508	645	756	864
300 Flanged	254	295	337	397	533	670	790	902
300 x 150	--	--	327	389	522	657	773	883
B	84	102	116	146	200	254	300	356
C	305	311	318	330	363	414	457	522
D	38	43	65	81	109	135	235	273
Threaded Ends	121	140	159	--	--	--	--	--
E 150 Flanged	121	140	152	191	254	324	378	432
300 Flanged	127	149	162	200	267	337	395	451
Threaded Ends	83	102	114	--	--	--	--	--
F 150 Flanged	83	102	102	127	152	203	219	349
300 Flanged	89	109	111	135	165	216	236	368
G & H	152	170	197	200	216	248	337	362

Valve Capacity

Valve Sizes in Inches:	2"	2 1/2"	3"	4"	6"	8"	10"	12"
NFPA 20 Maximum								
Recommended GPM	208	300	500	1000	2500	5000	11000	16000



E-50B-4KG1 (R-9/2011)

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