WALDRON
ENGINEERING & CONSTRUCTION, INC.

Norfolk Navy Shipyard (NNSY)
Portsmouth, VA
Pump Test Stand Project

Section 434116.16
Test Water Storage Tank
WTR-TK-1 & WTR-TK-2

Scope of Supply: **One (1) 7,452 Gallon Demineralized water Storage Tank**

Description: Tank shall be an atmospherically vented, single walled, lined storage tank. Tank shall be designed for vertical installation.

Design Codes: See Waldron design basis document

Service: Demineralized water
Design Storage Capacity: 7,452 gallons
Containment: Single Wall
Preferred Dimensions: Cylindrical, 8' diameter x 21' tall

Governing Codes and Standards:
American National Standards Institute (ANSI)
American Society of Testing and Materials (ASTM)
American Society of Mechanical Engineers (ASME)
Structural Steel Painting Council (SSPC)
Underwriters Laboratories (UL)
2005 Virginia State Building Code

Materials of Construction:

Tank Shell: Mild Carbon Steel with Flat Bottom and Coned Top
Shell & Bottom Gauge: 1/4" min
Top Head Gauge: 7 ga. Min
System Connections: All Flanges Shall Be ANSI B16.5, Class 150 Raised Face Flanges (refer to Table Below)
Internal Coating: Thermo-plastic not-less-than 20 mils thick
Exterior Coating Exterior Commercial Blast, (SSPC-6), Shop Std. Primer with Exterior Polyurethane Paint

Connections: Manufacturer's Standard (with minimum connections as listed below)

ID	Quantity	Size	Connection	Description
A	1	18"	Flanged	Test Line 3 S/R
B	1	10"	Flanged	Test Line 2 S/R
C	1	4"	Flanged	Test Line 1 S/R
D	1	3"	Flanged	Misc.
E	2	1"	Flanged	Instrumentation
F	1	24"	Flanged	Tank interconnection
G	1	24"	Tight Bolt	Side Manway

Instrumentation:

Qty	Description	Location
1	Differential pressure transmitter (Rosemount 3051) pre-programmed as level	Tank Connections E

Accessories:
Lifting Lugs
Grounding Plates (2)
Instrument tubing (ship loose for field assembly by others)

Submittals With Bid:
(4 hard & 2 electronic copies)
1) Drawings with Principle Dimensions, Maintenance Space Requirements and Connection Locations.
2) Description of Materials of Construction.
3) Dry and Flooded Weights.
4) Description and cut sheets for all associated instrumentation & accessories.

Submittals With Award:
(2 hard & 2 electronic copies)
1) Fully Dimensioned, Certified Drawings.
2) Rigging and Installation Instructions.
3) Operating & Maintenance Manual
4) Vendor cut sheets for all instruments & accessories.

Submittals With Shipment:
(2 hard & 2 electronic copies)
1) Certified Test Reports For All Shop Testing.

WALDRON ENGINEERING & CONSTRUCTION, INC.	**Norfolk Navy Shipyard (NNSY)** **Portsmouth, VA** **Pump Test Stand Project** **Section 434116.18** **Boost Pump skid** ***DEMIN-SK-1***

Scope of Supply: **One (1) 300 gpm boost pump skid w/local control panel**

Description: All SS demineralized water boost pump skid designed to lift 300 gpm from a gravity truck fill line to the top of a 21' storage tank through a 2" fill line

Design Codes: See Waldron design basis document

Service: Demineralized water
Design transfer Capacity: 300 gpm against max. 3 psig backpressure
Power feed: 30 amp-120 VAC single point feed

Materials of Construction:

Piping: Sch 10 SS piping
Receiver: SS tank w/gauge
System Connections: All Flanges Shall Be ANSI B16.5, Class 150 Raised Face Flanges (refer to Table Below)
Exterior Coating Shop Std. Primer with Paint

Control Panel: 120 VAC single point feed w/internal motor starter, start/stop pushbutton, e-stop, running light, power available light, alarm light, fused disconnect, remote stop relay (24 VDC rated 100 mA coil), remote running relay (24 VDC rated contacts form "C")

Instrumentation:

Qty	Description
1	Wika Inlet/Outlet pressure gauges
1	Tank sight glass

Accessories:
Supply and discharge full-port ball valves
Separate Grounding lugs for control panel and pump motor
Pump discharge thermo-relief to suction piping (1/2")

Submittals With Bid:
(4 hard & 2 electronic copies)
1) Drawings with Principle Dimensions, Maintenance Space Requirements and Connection Locations.
2) Description of Materials of Construction.
3) Dry and Flooded Weights.
4) Description and cut sheets for all associated instrumentation & accessories.

Submittals With Award:
(2 hard & 2 electronic copies)
1) Fully Dimensioned, Certified Drawings.
2) Rigging and Installation Instructions.
3) Operating & Maintenance Manual
4) Vendor cut sheets for all instruments & accessories.

Submittals With Shipment:
(2 hard & 2 electronic copies)
1) Certified Test Reports For All Shop Testing.

Vendor Cutsheets

1.01 Electrical Equipment

A. 480V Low Voltage Switchgear
B. 500HP VFD
C. Motor Control Center
D. 60A, 200A, 600A Disconnect Switch
E. 40KVA UPS
F. 208Y/120VAC Panel

1.02 I&C Equipment (Instruments)

A. Flow transmitter
B. Pressure Transmitter
C. Temperature Transmitter
D. Control Valve

1.03 I&C Equipment (Control System)

A. Hybrid/DCS system

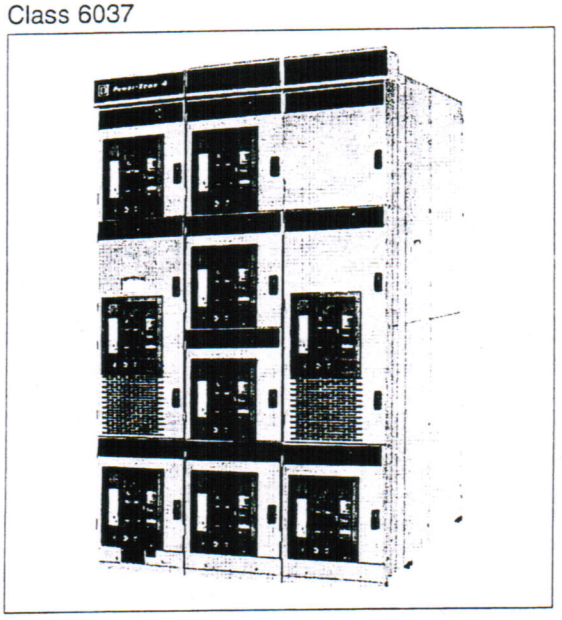
Catalog

05

Power-Zone® 4

Low Voltage, Metal-Enclosed, Drawout Switchgear with Masterpact® NW and NT Low Voltage Power Circuit Breakers

Class 6037



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"General and Application Information" 11
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a brand of Schneider Electric

SQUARE D

Interrupting and Short-Time (Withstand) Capability

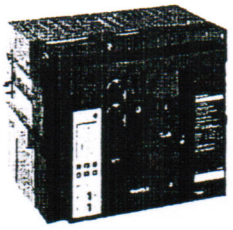
Power-Zone 4 switchgear with Masterpact NW circuit breakers have the highest interrupting (200,000 A at 480 V without using fuses) and short-time (withstand) ratings for low voltage switchgear in the smallest physical size. The small switchgear footprint and the elimination of limiters reduces cost. The Masterpact NW and NT circuit breakers' wide range of coordination with downstream devices increases system uptime.

Masterpact NW circuit breakers are available in various levels of interrupting ratings (AIR). See "Masterpact NW and NT Circuit Breaker Interrupting Rating" on page 39.

NOTE: Circuit breakers of like frame sizes and interrupting ratings are interchangeable.

Circuit Breaker Types

Figure 15: Family of Masterpact Circuit Breakers (800 A–5000 A)

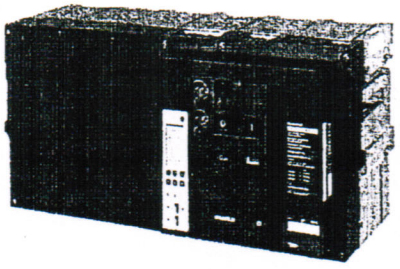


NW08, NW16, NW20, NW32 (800 A–3200 A) N1, H1, H2

NW08, NW16 (800 A–1600 A) L1, L1F

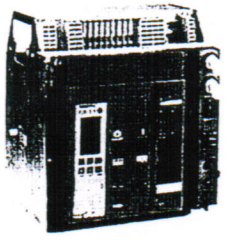
NW20 (2000 A) L1, L1F-Feeder

Number	Amperes
NW08N1 NW08H1 NW08H2 NW08L1 NW08L1F	800
NW16N1 NW16H1 NW16H2 NW16L1 NW08L1F	1600
NW20H1 NW20H2 NW20L1 NW08L1F	2000
NW32H1 NW32H2 NW32L1	3200
NW40H2 NW40L1	4000
NW50H2 NW50L1	5000
NT08N1	800



NW40, NW50 (4000 A–5000 A) H2, L1

NW20, NW32 (2000 A–3200 A) L1



NT08N1 (800 A)

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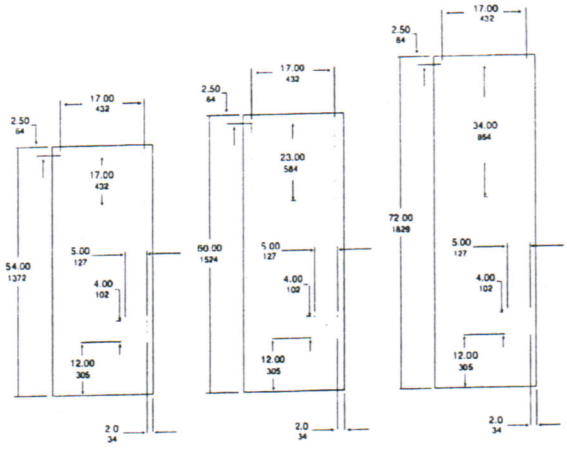
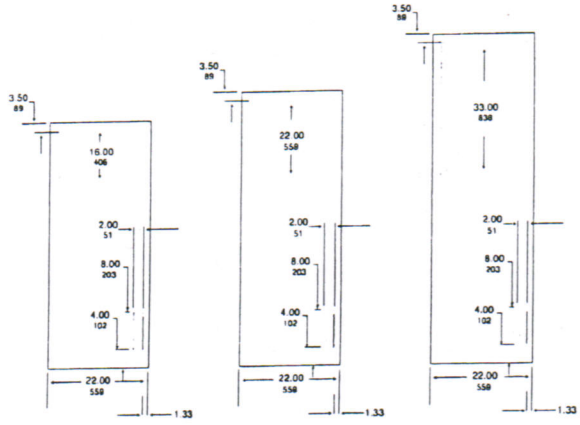
TOP AND BOTTOM CONDUIT ENTRANCE LAYOUTS

Figure 48: Top and Bottom Conduit Entrance Dimensions (22-inch wide)– Not for Construction (consult factory drawings)



Top Conduit Entrance–Auxiliary Section (22-inch wide)



Bottom Conduit Entrance–Auxiliary Section (22-inch wide)

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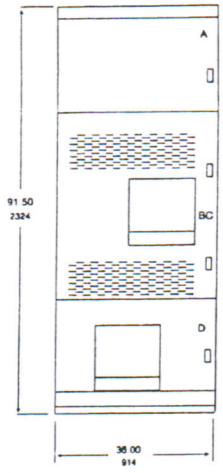
Figure 57: Front Elevation Dimensions–Not for Construction (consult factory drawings)



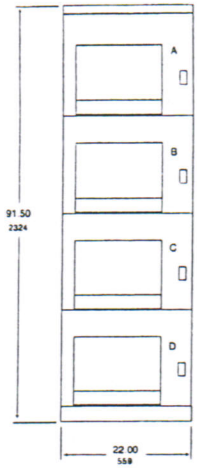
Typical Main and Tie Circuit Breakers–C (36-inch wide)

Table 13: Typical Main and Tie–C (36-inch wide)

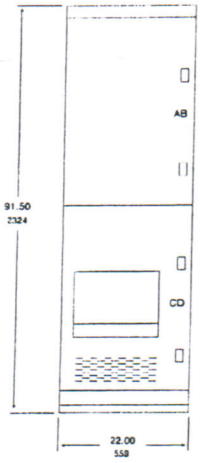
Location	Description	Frame Size	Frame SCCR
A	Blank or instrument	–	–
BC	Main or tie	4000 A–5000 A	H2
D	Feeder	800 A–2000 A	N1–H2

Table 14: Typical Feeder–A (22-inch wide)

Location	Description	Frame Size	Frame SCCR
A	Feeder	800 A–2000 A	N1–H2, L1F, NT
B	Feeder	800 A–2000 A	N1–H2, L1F, NT
C	Feeder	800 A–2000 A	N1–H2, L1F, NT
D	Feeder	800 A–2000 A	N1–H2, L1F, NT



Typical Feeder Circuit Breakers–A (22-inch wide)



Typical Feeder Circuit Breakers–B (22-inch wide)

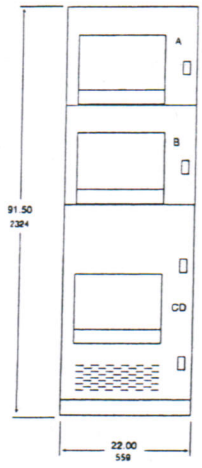
Table 15: Typical Feeder–B (22-inch wide)

Location	Description	Frame Size	Frame SCCR
AB	blank or instrument		
CD	Feeder	3200 A	H1–H2

Table 16: Typical Feeder–C (22-inch wide)

Location	Description	Frame Size	Frame SCCR
A	Feeder	800 A–2000 A	N1–H2, L1F, NT
B	Feeder	800 A–2000 A	N1–H2, L1F, NT
CD	Feeder	3200 A	H1–H2

NOTE: Any main, tie, or feeder compartment positions may be used as a blank, or instrument compartment. Not convertible for future circuit breaker use. Height including secondary wiring trough compartment is 93.7 inches (2380 mm).



Typical Feeder Circuit Breakers–C (22-inch wide)

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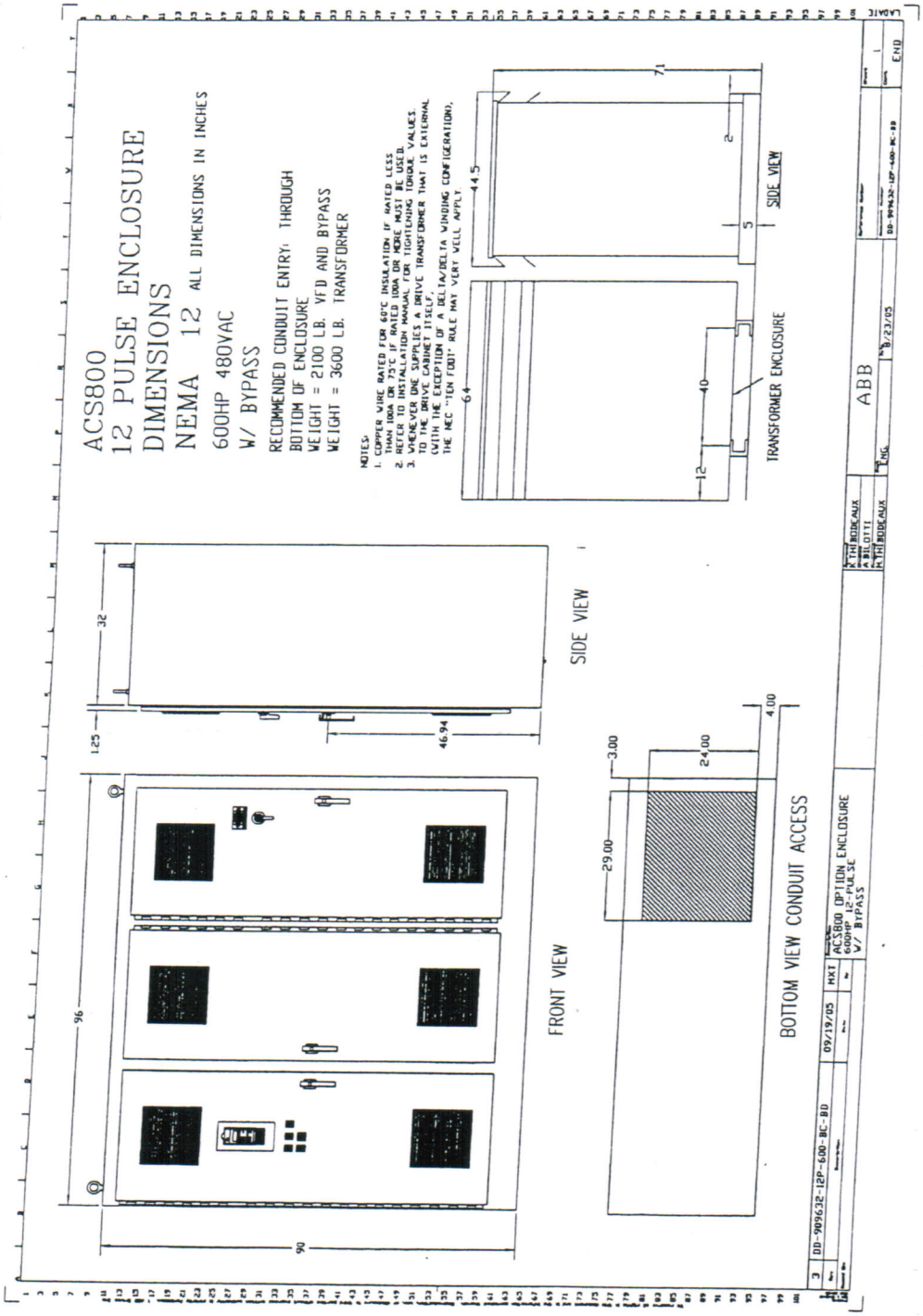
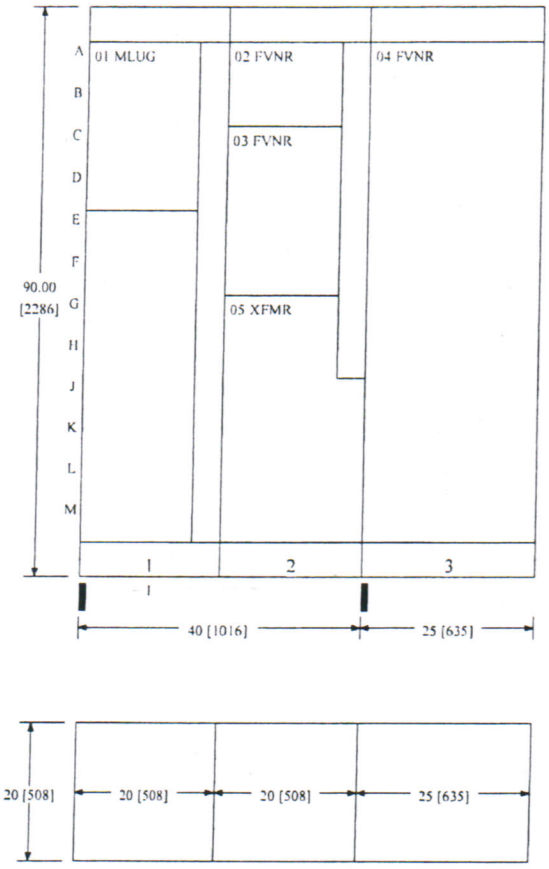
1.01.B. 500HP VFD



1.01.C. Motor Control Center

Rockwell Automation/Allen-Bradley
CENTERONE MOTOR CONTROL CENTER LINE-UP



NOTE : Dimensions are subject to change after design review.
ENCLOSURE : 1 - General Purpose

SECTION CODE LEGEND

6 = 600 amp vertical bus in section	N = Neutral connection plate in section
9 = 9-inch wireway section	P = Pull box mounted on top of section
C = Corner section	V = 9-inch wireway has Vertical Neutral Bus
I = Incoming line in section	W = Implicit 9-inch wireway in section

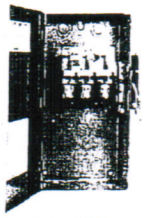
CUSTOMER : NNSY
SALESPERSON :
MCC : MCC 1
REF NUM : 0/1
DATE/TIME : 12/14/06 / 16:46:32

Line-Up Page 1 of 1

600V AC Heavy Duty, Non-Fusible, Single Throw

Specifications

- 30 – 1200 amperes.
- Horsepower rated through 800 amperes.
- Suitable for service entrance use, except 1200 ampere on 480Y/277 or 600Y/347 grounded wye systems, per NEC 215-10 and 230-95, and 4-pole switches.
- UL listed File No. E5239.
- For factory modifications refer to **Pages 8-6** through **8-9**.



DH362UGK

8

Table 8-43. Non-Fusible 277/480 – 600 Volts

System	Ampere Rating	Maximum Horsepower Ratings								NEMA 1 Enclosure Indoor		NEMA 3R Enclosure Rainproof	
		1-Phase AC			3-Phase AC			DC		Catalog Number	Price U.S. $	Catalog Number	Price U.S. $
		240V	480V	600V	240V	480V	600V	250V	600V				
2-Pole — 480V AC — 600V AC or DC [1] (Suitable for Service Entrance Use with a Neutral or Ground Lug Kit Installed)													
	30	3	7-1/2	10	—	—	—	—	15	DH261UGK	201.	[2]	—
	60	10	20	25	—	—	—	—	25	DH262UGK	354.	[2]	—
	100	20	30	40	—	—	—	20	25	DH263UGK	585.	[2]	—
	200	15	50	50	—	—	—	—	50	—	—	[2]	—
	400	—	—	—	—	—	—	50	—	DH265UGK	1,950.	[2]	—
	600	—	—	—	—	—	—	—	—	DH266UGK	3,525.	[2]	—
	800	—	—	—	—	—	—	—	—	DH267UGK	7,070.	[2]	—
	1200	—	—	—	—	—	—	—	—	[3]	—	[2]	—
3-Pole — 480V AC — 600V AC, 250V DC (Suitable for Service Entrance Use with a Neutral or Ground Lug Kit Installed)													
	30	3	7-1/2	10	10	20	30	5	—	DH361UGK	213.	DH361URK	367.
	60	10	20	25	20	50	60	10	—	DH362UGK	367.	DH362URK	670.
	100	20	40	50	40	75	100	20	—	DH363UGK	615.	DH363URK	960.
	200	15	50	50	50	125	150	40	—	DH364UGK	930.	DH364URK	1,125.
	400	—	—	—	125	250	350	50	—	DH365UGK	2,160.	DH365URK	2,835.
	600	—	—	—	200	400	500	—	—	DH366UGK	3,830.	DH366URK	5,860.
	800	—	—	—	—	500	500	—	—	DH367UGK	7,580.	DH367URK	10,050.
	1200	—	—	—	—	—	—	—	—	DH368UGK	9,750.	DH368URK	12,980.
4-Pole — 480V AC — 600V AC, 250V DC		**2-Phase AC**			**3-Phase AC**								
	30	10	20	25	10	20	30	5	—	DH461UGK	815.	[4]	—
	60	20	40	50	20	50	60	10	—	DH462UGK	655.	[4]	—
	100	40	50	50	40	75	100	20	—	DH463UGK	1,205.	[4]	—
	200	50	50	50	80	125	150	40	—	DH464UGK	1,745.	[4]	—
	400	50	—	—	125	250	350	—	—	DH465UGK	3,695.	[3]	—
	600	—	—	—	200	400	500	—	—	DH466UGK	6,450.	[3]	—
	800	—	—	—	—	—	—	—	—	[3]	—	[3]	—

[1] DC rating for 400 – 800 ampere switches is 250 volts.
[2] Use 3-pole catalog numbers below.
[3] Contact the Safety Switch Flex Center (1-888-329-9272) for availability of this product.
[4] NEMA 12 enclosures (30 – 200 amperes) can be field modified to meet NEMA 3R rainproof requirements when a factory provided drain hole is opened.

Discount Symbol 22-CD

Dimensions

Note: Dimensions are for estimating purposes only.

Table 8-30. Heavy Duty, Non-Fusible, 600V, 3-Pole, Single Throw

Ampere Rating	NEMA 1, 3R			NEMA 12, 4XSS		
	Dimensions in Inches (mm)			Dimensions in Inches (mm)		
	Height	Width	Depth	Height	Width	Depth
30	15-7/8 (403)	8-1/8 (206)	10 (254)	12-1/8 (308)	8-1/8 (206)	10 (254)
60	15-7/8 (403)	8-1/8 (206)	10 (254)	12-1/8 (308)	8-1/8 (206)	10 (254)
100	21-11/16 (551)	11-1/8 (283)	10 (254)	24 (610)	11-1/8 (283)	10-1/4 (260)
200	27-5/8 (702)	16 (406)	11-1/4 (286)	34-3/8 (873)	16 (406)	11-1/2 (292)
400	45-3/16 (1148)	23 (584)	12-5/8 (321)	57-5/8 (1464)	23 (584)	12-5/8 (321)
600	52-11/16 (1339)	24 (610)	14-1/4 (362)	63 (1600)	24 (610)	14-1/4 (362)
800	56-11/16 (1440)	25-3/8 (645)	14-1/4 (362)	71-3/4 (1822)	25-3/8 (645)	14-1/4 (362)
1200	70-5/16 (1786)	41-15/32 (1053)	19-15/16 (507)	70-5/16 (1786)	41-15/32 (1053)	19-15/16 (507)

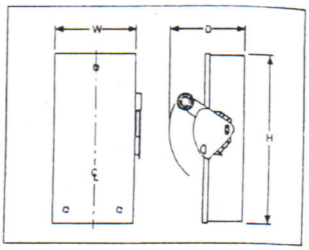


Figure 8-3. NEMA 1-3R Heavy Duty
30 – 1200 Amperes

8

Note: 600A dimensions become applicable in the second quarter of 2002.

Table 8-31. Heavy Duty, Fusible, 240V and 600V, 3-Pole Solid Neutral, Single Throw

Ampere Rating	NEMA 1, 3R			NEMA 12, 4XSS		
	Dimensions in Inches (mm)			Dimensions in Inches (mm)		
	Height	Width	Depth	Height	Width	Depth
30	15-7/8 (403)	8-1/8 (206)	10 (254)	17-7/8 (454)	8-1/8 (206)	10 (254)
60	15-7/8 (403)	8-1/8 (206)	10 (254)	17-7/8 (454)	8-1/8 (206)	10 (254)
100	21-11/16 (551)	11-1/8 (283)	10 (254)	24 (610)	11-1/8 (283)	10-1/4 (260)
200	27-5/8 (702)	16 (406)	11-1/4 (286)	34-3/8 (873)	16 (406)	11-1/2 (292)
400	45-3/16 (1148)	23 (584)	12-5/8 (321)	57-5/8 (1464)	23 (584)	12-5/8 (321)
600	52-11/16 (1339)	24 (610)	14-1/4 (362)	63 (1600)	24 (610)	14-1/4 (362)
800	56-11/16 (1440)	25-3/8 (645)	14-1/4 (362)	71-3/4 (1822)	25-3/8 (645)	14-1/4 (362)
1200	70-5/16 (1786)	41-15/32 (1053)	19-15/16 (507)	70-5/16 (1786)	41-15/32 (1053)	19-15/16 (507)

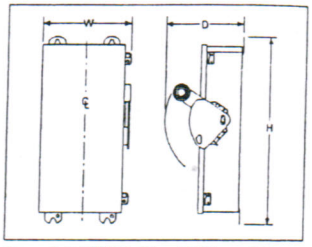


Figure 8-4. NEMA 4, 4X and 12 Heavy Duty
30 – 800 Amperes

Note: 600A dimensions become applicable in the second quarter of 2002.

Table 8-32. Heavy Duty, Non-Fusible, 240V and 600V, 3-Pole, Double Throw

Ampere Rating	NEMA 1, 3R			NEMA 12, 4XSS		
	Dimensions in Inches (mm)			Dimensions in Inches (mm)		
	Height	Width	Depth	Height	Width	Depth
30	24-5/8 (625)	11-15/16 (303)	9-7/8 (251)	25-7/8 (657)	12 (305)	10-1/4 (260)
60	24-5/8 (625)	11-15/16 (303)	9-7/8 (251)	25-7/8 (657)	12 (305)	10-1/4 (260)
100	24-5/8 (625)	11-15/16 (303)	9-7/8 (251)	25-7/8 (657)	12 (305)	10-1/4 (260)
200	37-3/8 (949)	19-9/16 (497)	11-1/4 (286)	41 (1041)	19-1/2 (495)	11-5/8 (295)
400	53-13/16 (1367)	23-1/8 (587)	12-1/2 (318)	57-1/2 (1460)	23 (584)	12-1/2 (318)
600	63-5/16 (1608)	24-1/8 (613)	14-1/8 (359)	—	—	—
800	63-5/16 (1608)	24-1/8 (613)	14-1/8 (359)	—	—	—

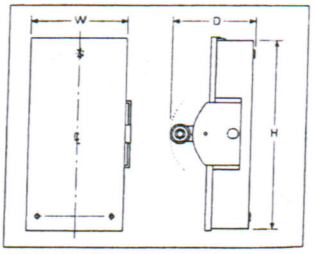


Figure 8-5. NEMA 1-3R Double Throw
30 – 800 Amperes

Table 8-33. Heavy Duty, Fusible, 240V and 600V, 3-Pole, Double Throw

Ampere Rating	NEMA 1, 3R			NEMA 12, 4XSS		
	Dimensions in Inches (mm)			Dimensions in Inches (mm)		
	Height	Width	Depth	Height	Width	Depth
30	36-5/8 (930)	11-15/16 (303)	9-7/8 (251)	39-13/16 (1011)	12 (305)	10-1/4 (260)
60	36-5/8 (930)	11-15/16 (303)	9-7/8 (251)	39-13/16 (1011)	12 (305)	10-1/4 (260)
100	36-5/8 (930)	11-15/16 (303)	9-7/8 (251)	39-13/16 (1011)	12 (305)	10-1/4 (260)
200	50-7/8 (1292)	19-9/16 (497)	11-1/4 (286)	55-5/8 (1413)	19-9/16 (497)	11-5/8 (295)
400	74-3/4 (1898)	25-3/8 (645)	14-1/8 (359)	74-3/4 (1899)	25-3/8 (645)	14-1/8 (359)
600	86-1/8 (2188)	27-7/16 (697)	14-1/8 (359)	—	—	—

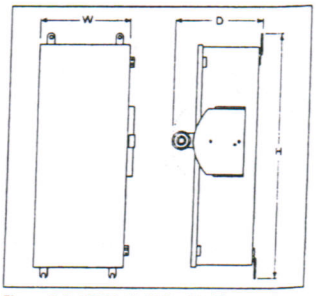
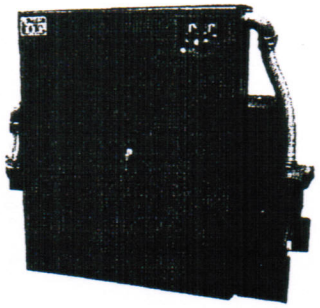


Figure 8-6. NEMA 12-4X Double Throw
30 – 400 Amperes

PRECISE POWER CORPORATION

12297 U.S. HWY 41 NORTH • PALMETTO, FLORIDA, 34221 U.S.A.
PHONE: (941) 722-1600 FAX: (941) 729-4337
E-MAIL: info@precisepwr.com
WEB SITE: www.precisepwr.com

Written-Pole®
Roesel Motor-Generator (RMG®)



Line Isolation, Power Quality and Uninterruptible Power System – Without Batteries

APPLICATIONS: The RMG is designed to supply **continuous clean power** to sensitive electrical loads in commercial and industrial installations. Loads such as computers, security systems, machinery, medical devices, communications, controls, instruments, and lights are provided **the ultimate isolation and continuous protection** from spikes, dips, and other variations in the utility power. The RMG also prevents load harmonics from feeding back into the building wires and utility system through complete electrical isolation.

Precise Uninterruptible Power is generated by the patented Written-Pole generator even when utility power blinks out for several seconds during bad weather or utility switching. These "blinkouts", voltage surges and dips cause more than 99% of power problems. The rugged reliable rotary energy in the RMG is designed to ride through the longest utility "blinkouts" or dips and absorb even the worst power surges. Some cases need continuous power for the few times when the "blinkout" becomes a blackout. The RMG can supply 12 seconds of ride-through at full load, which is enough time to start a stand-by engine-generator with No-Break in power to the sensitive load. No batteries are required for uninterruptible power. The RMG is completely packaged with electrical contactors, automatic bypass system, electronic controls, internal computer and safety devices.

Written-Pole and RMG are Registered Trademarks of Precise Power Corporation, Palmetto, Florida, U.S.A.

Roesel Motor-Generator (RMG®)

Specifications

	35 kVA	40 kVA	50 kVA	60 kVA
PHYSICAL				
Dimensions in Inches (WxHxD)	60 W x 63 H x 50 D	60 W x 63 H x 50 D	69 W x 64 H x 50 D	69 W x 47 H x 48 D
Weight	7895 lbs.	10,664 lbs.	11,665 lbs.	13,520 lbs.
Shipping Weight (approx.)	8195 lbs.	10,964 lbs.	12,000 lbs.	13,820 lbs.
Minimum Cooling Air Flow	2000 CFM	3500 CFM	4500 CFM	5,250 CFM
Maximum Heat Rejection	18,200 Btu/Hr	19,270 Btu/Hr	24,000 Btu/Hr	29,000 Btu/Hr
Noise Level, Measured @ 3 feet	75 dBA	75 dBA	75 dBA	75 dBA
Ambient Temperate Range	4°C to 40°C	4°C to 40°C	4°C to 40°C	4°C to 40°C
Maximum Relative Humidity, Non-Condensing	<100%	<100%	<100%	<100%
Storage	-40° to 60°C	-40° to 60°C	-40° to 60°C	-40° to 60°C

INPUT				
Voltage AC (+10% - 15%) 3-Phase, 4 wire	208	208 / 480	208	480
Frequency	60 Hz (Nom) 58.5 Hz (Min)	60 Hz (Nom) 58.5 Hz (Min)	60 Hz (Nom) 58.5 Hz (Min)	60 Hz (Nom) 58.5 Hz (Min)
Current: @ Rated Voltage	-	-	-	-
Full Load	100A	105A / 45A	130A	67A
Starting Inrush	250A	263A / 113A	239A, PF Corrected	168A
Power Factor, Full Load	0.95 (Min)	0.95 (Min)	0.95 (Min)	0.95 (Min)

OUTPUT				
kW	28	32	40	48
Load Power Factor	0.9 Leading to 0.8 Lagging	0.9 Leading to 0.8 Lagging	0.9 Leading to 0.8 Lagging	0.9 Leading to 0.8 Lagging
Voltage AC	208 (120)	208 (120) / 480 (277)	208 (120)	480 (277)
Frequency (synchronous to input)	60 Hz	60 Hz	60 Hz	60 Hz
Current: PF = 1.0 PF = 0.8	78A 98A	89A / 38A 111A / 48A	111A 139A	58A 72A
VOLTAGE REGULATION:				
Steady-State	± 5%	± 5%	± 5%	± 5%
Transient (0-50 msec) < 50% load step	-15% to +10%	-15% to +10%	-15% to +10%	-15% to +10%
Transient (50 msec – 500 msec) < 50% load step	± 8%	± 8%	± 8%	± 8%
Harmonic Content (Linear Load)	≤ 3%	≤ 3%	≤ 3%	≤ 3%

LOAD CONDITION	**Full**	**Full**	**Full**	**Full**
Ride-through Time	12 Seconds	12 Seconds	12 Seconds	12 Seconds
Efficiency %	84	85	85	85

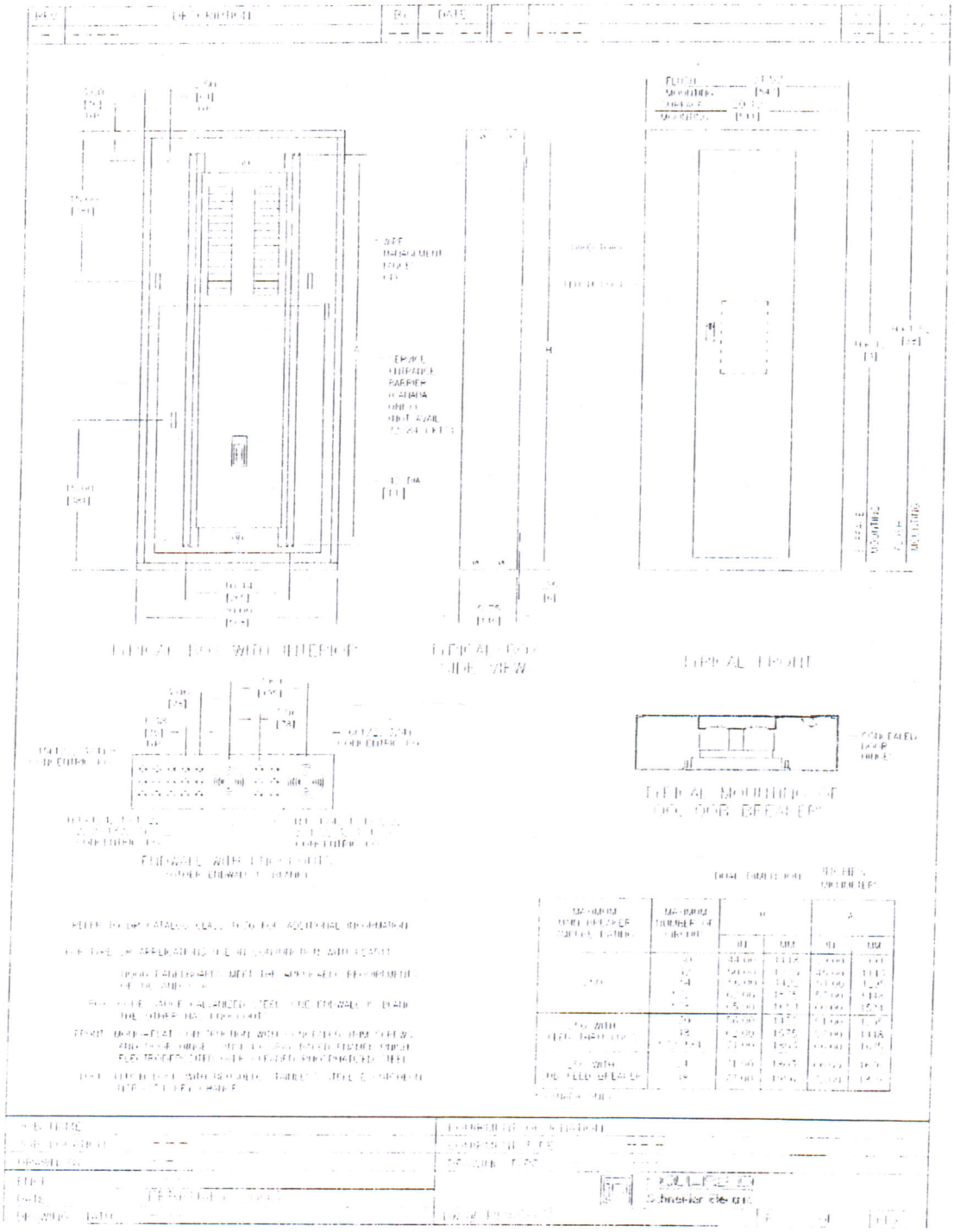
Specifications are subject to change without notice.

1.01.F. 208Y/120VAC Panel

1 **Designation:** LA
NQOD MB PANELBOARD (INTERIOR)
NQOD PANELBOARD
CONSISTING OF
208Y/120 VAC 3PH 4W 60 HZ SCCR:10K
MAIN: 150A QB CIRCUIT BREAKER
INCOMING CONDUCTOR(S): (1)#4-300 kcmil Al/Cu
BUS: ALUMINUM TIN PLATING
GROUND BAR
TYPE 1 50"H X 20"W X 5.75"D
INCOMING : BOTTOM SURFACE W/DOOR
BOX CAT#: MH50 FRONT CAT#: MHC50S
REF. DRAWING: PBA 507A
BRANCHES:
(1) 50A/2P QOB
(5) 20A/2P QOB
(4) 15A/2P QOB
(1) 50A/1P QOB
(5) 40A/1P QOB
(1) 30A/1P QOB
(14) 20A/1P QOB
(1) 15A/1P QOB
SPECIAL: STANDARD SOLID NEUTRAL,
WHT FACE/BLCK LET NAMEPLATE

1 **Designation:** LA
MH50 (BOX)
STANDARD TYPE 1 BOX HGT 50"

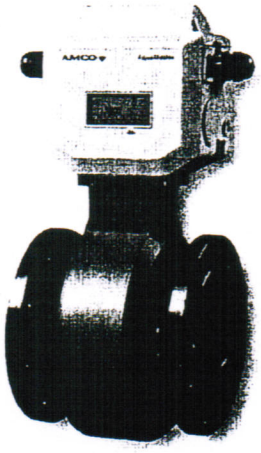
1 **Designation:** LA
MHC50S (FRONT)
NQOD TYPE 1 SURFACE TRIM FRT HGT 50



1.02.A Flow meter

The Next Generation Commercial Water Flow Meter

AquaMaster™, available in sizes 5/8" to 24" (15 to 600 mm), is the total solution for flow measurement in the water industry. Outstanding performance, innovative features and user benefits, coupled with low cost of ownership ensures that AquaMaster™ is the first choice for bulk revenue, fire service, custody transfer and production metering.



AquaMaster™ has been designed specifically for the water industry in response to its stringent demands for enhanced metering capability; enabling ever more efficient and cost effective operation and compliance with increasing legal requirements.

In addition to high measurement performance the AquaMaster offers reading of totalizers via the industry standard inductive pad reader or radio frequency automatic meter reading. This feature allows easy access to billing information without the need to physically access the meter.

No External Power Required for Remote Locations

- No external power supply (2 internal batteries)
- 3-year battery life (28 months on 14" meters or larger)
- Site-replaceable batteries
- Unique battery management system gives a battery replacement window in excess of 1 year, with no flat-battery interruption to measurement.

AquaMaster™ is the ideal solution for locations where there is no external power. Through new design technology two user-replaceable internal batteries provide a 3-year battery life, thus eliminating the high cost of providing a power supply to the meter.

Typical Applications

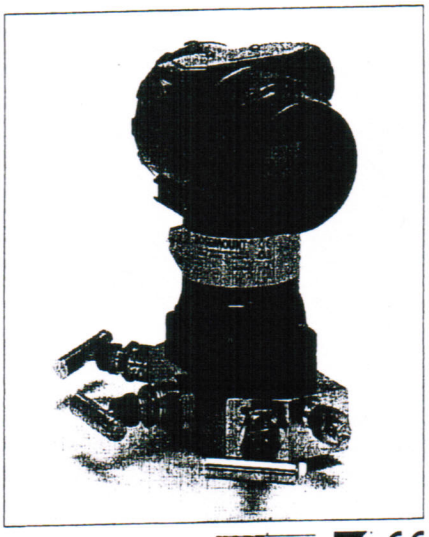
- Bulk revenue
- Custody transfer
- Production metering
- Treated effluent

Product Data Sheet
00813-0100-4001, Rev FA
Catalog 2005

Rosemount 3051 Pressure Transmitter

HART® AND FOUNDATION™ FIELDBUS PROTOCOLS

- *Best-in-Class performance, 0.04% High Accuracy option*
- *Industry first five-year stability under actual process conditions*
- *Unmatched Dynamic Performance*
- *Coplanar™ platform enables integrated pressure, flow, and level solutions*
- *Advanced PlantWeb® Functionality*



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HART FOUNDATION CE

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ROSEMOUNT

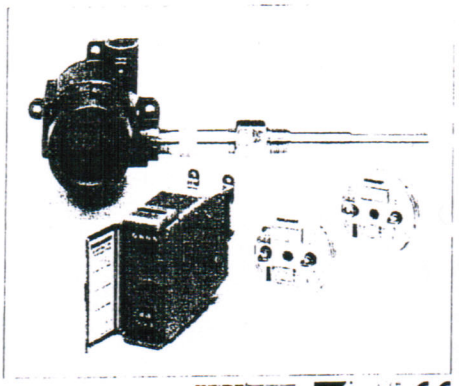
www.rosemount.com

EMERSON.
Process Management

Product Data Sheet
00813-0100-4728, Rev KA
Catalog 2005

Rosemount 644 Head and Rail Mount Temperature Transmitters

- *Communicates easily using either 4-20 mA/HART® or FOUNDATION™ fieldbus protocol*
- *Meets NAMUR NE 21 standard ensuring reliable transmitter performance for HART head mount products*
- *The Transmitter-Sensor Matching feature improves temperature measurement accuracy by up to 75% when compared to unmatched assemblies*
- *The integral LCD Display conveniently displays the primary sensor input, and diagnostics of the transmitter*
- *An installation-ready solution that provides a variety of mounting options, transmitter configurations, and sensors/thermowells*



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HART

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ROSEMOUNT
www.rosemount.com

EMERSON
Process Management

1.02.D. Control Valve

CELEBRATING 20 YEARS

The High Performance Company

DeltaV

Workstation Hardware

DeltaV workstation hardware includes a monitor, CPU, keyboard, mouse, and speakers.

- Pre-installed software
- Easy control network installation
- Choose between PCs and servers to optimize your cost/performance
- Choices for data backup, remote diagnostics, RAID, and dual and quad monitors

Introduction

DeltaV software runs on an Intel Pentium-based workstation. Available as a PC with single or dual monitors, or as a server with a single monitor, the selection of workstations provides the performance you need to engineer your control strategy and operate your process.

Emerson Process Management leadership in service and quality is legendary. That is why we supply you with a guaranteed solution. You will never be bothered with incompatible drivers, bad or overwritten DLLs, or substandard hardware. You will not waste time in no-value engineering. Instead, you can focus on the process.

Benefits

Pre-installed software. When ordered through a DeltaV system integrator, the pre-loaded workstation, monitor, keyboard, and mouse are delivered ready to plug and play in your DeltaV system. This is hassle-free hardware delivery. No third-party interfaces, compatibility problems, nor

EMERSON
Process Management

— END OF SECTION —

System: pump test stand Rev 2
Lineup: Case 3 - Medium 2000gpm 750TDH
rev: 03/01/07 4:02 pm

Atm pressure: 14.7 psi a

03/01/07 4:38 pm

Company: Waldron Engineering & Construction, Inc.
Project: Navy
by: Keith Christopher

LIST REPORT

Total System Volume: 8986 gallons
Pressure drop calculations: Darcy-Weisbach method.
Calculated: 1 iteration Avg Deviation: 0 %

PIPELINES

Pipeline	From	To	Status	Flow (US gpm)	Velocity (ft/sec)	dP (psi)	HL (ft)
P1	Goulds 3260 8x10-13A	FV0205		2000	8.144	0.812	1.878
P10	Water Tanks	Goulds 3260 8x10-13A		2000	8.144	(6.456)	3.558
P2	FV0205	Tee		2000	8.144	0.668	1.547
P3	Goulds 3620 12x14-20A	FV0105	XXX	---	---	---	---
P4	FV0105	Tee	XXX	---	---	---	---
P5	Tee	Water Tanks		2000	2.31	0.882	0.041
P6	Ingersol-Rand WD32	FV0305	XXX	---	---	---	---
P7	FV0305	Water Tanks	XXX	---	---	---	---
P8	Water Tanks	Ingersol-Rand WD32	XXX	---	---	---	---
P9	Water Tanks	Goulds 3620 12x14-20A	XXX	---	---	---	---