

Medium	Colour	ID Code	Abbreviation
Raw Water Supply	Light Blue	502-106	RW
Treated Water	Green	503-107	TW
Hypochlorite	Yellow	505-102	CL
Domestic Cold Water	Green	503-107	DCW
Domestic Hot Water	Dark Blue	202-101	DHW
Fuel Oil Supply	Yellow	505-101	FOS
Fuel Oil Return	Yellow	505-101	FOR
Instrumentation	Grey	501-107	SA, DA
Vents	Same colour as line being vented		VENT
Sample Line	same colour as line being sampled.		SAM

3.0 EXECUTION

3.1 Equipment Manufacturer's Nameplates

- .1 Locate nameplates so that they are easily read. Do not insulate or paint over plates.

3.2 Equipment Project Identification

- .1 Plates shall be attached to the equipment with sheet metal screws or nuts and bolts (adhesive will not be accepted).
- .2 Fasten plates in conspicuous locations. Where plates cannot be mounted on hot or cold surfaces, provide standoffs.

3.3 Valves

- .1 Attach brass tags to all valves with supplied chains. Ensure tags are easily accessible and do not conflict with valve operation.

3.4 Piping

- .1 On completion of protective coatings or finish painting, neatly stencil on yellow, green or white backgrounds, as appropriate, direction flow arrows and the pipe service.
 - At each valve
 - On both sides of wall penetrations
 - At floor and roof penetrations
 - On each leg of branches

Every 15 metres along continuous runs

END OF SECTION

1.0 GENERAL

1.1 Work Included

- .1 Disinfection of water retaining structures and piping.

1.2 Related Work

- .1 General Process Provisions: Section 13001

1.3 Related Codes

- .1 AWWA C651-99 Disinfecting Water Mains
- .2 AWWA C652-02 Disinfection of Water Storage Facilities
- .3 AWWA C653-97 Disinfection of Water Treatment Plants

1.4 Coordination

- .1 Coordinate with other Divisions to ensure there are no conflicts in the Work.

1.5 Schedule of Items to be Disinfected

- .1 The Contractor shall disinfect all items which will be used for the conveyance or storage of potable water; these include but are not limited to the following structures and piping:
 - .1 All pipework conveying potable water, including but not necessarily limited to:
 - .1 Transfer piping to and from treated water reservoir
 - .2 Treated water reservoir
 - .3 Suction piping to all pumps
 - .4 Discharge pipework from truck fill pumps
 - .5 Plant service water lines

1.6 Entry Into Existing Structures

- .1 Where work is undertaken within existing structures or piping used for the storage or conveyance of potable water, they shall be disinfected prior to being put back into service.

2.0 MATERIALS

2.1 Water

- .1 Water for disinfection shall be provided by the Contractor. The water shall be free from all suspended and deleterious material.

2.2 Hypochlorite

- .1 Hypochlorite shall comply with AWWA B-300.

3.0 EXECUTION

3.1 Applicable Standards

- .1 Except as otherwise specified, the work shall be undertaken in accordance with the following codes:
 - .1 AWWA C651-99 Disinfecting Water Mains
 - .2 AWWA C652-02 Disinfection of Water Storage Facilities
 - .3 AWWA C653-97 Disinfection of Water Treatment Plants

3.2 Cleaning

- .1 All tanks and pipework to be disinfected shall be thoroughly cleaned prior to disinfection,
- .2 All construction material not part of the permanent structure shall be removed.
- .3 The surfaces of walls, floor and roof of structures shall be cleaned using a high pressure jet, sweeping, scrubbing or equally effective means.
- .4 Pipes shall be flushed to remove all dirt prior to disinfection. If necessary, the pipe shall be cleaned by swabbing or other mechanical means as directed by the Engineer.

3.3 Disinfection of Piping

- .1 Pipework shall be disinfected by adding a chlorine compound to the filling water during the pipe pressure test to produce an initial even concentration of at least 25 mg/L of free chlorine. The pipes shall be left full of chlorinous water for 24 hours and the free chlorine residual after 24 hours shall not be less than 10 mg/L.
- .2 If the chlorine residual is less than 10 mg/L after 24 hours, the main shall be flushed and the procedure repeated.

3.4 Disinfection of Structures

- .1 Structures and tanks shall be disinfected by either of the following two methods:
 - .1 The structure or tank shall be filled to the overflow level with water, with an initial even concentration of at least 25 mg/L of free chlorine. After 24 hours the free residual shall be at least 10 mg/L; if not, the procedure shall be repeated.
 - .2 A solution of 200 mg/L available chlorine shall be applied directly to the surfaces of all parts of the tank or structure including the underside of the roof. The solution shall be applied by suitable brushes or spray equipment, and shall

thoroughly coat all surfaces. The disinfected surfaces shall remain in contact with the solution for at least 30 minutes.

3.5 Disposal of Chlorinated Water

- .1 After the disinfection process is complete, the heavily chlorinated water shall be drained and disposed of in an approved manner.
- .2 Heavily chlorinated water shall not be discharged to local sewers or surface drains without first obtaining the permission of local regulatory authorities.
- .3 If other disposal methods are impractical, dechlorinate the chlorinous water using methods outlined in AWWA C653-97,

3.6 Filling of Piping and Structures

- .1 Immediately following the disposal of the heavily chlorinated water, the piping, tanks or structures shall be filled with potable water.
- .2 It is recommended that the potable water used for refilling of the structures be sampled to ensure that no bacteriological contamination exists in the fill water prior to placement in the pipes or structures.

3.7 Bacteriological Testings

- .1 After chlorination procedure is complete and the piping, tank or structure has been refilled with potable water, suppiculate samples shall be taken at least 30 minutes apart and shall be tested for coliforms in accordance with the Standard Methods for the Examination of Water and Wastewater.
- .2 For piping a minimum of one sample shall be collected from each line disinfected.
- .3 Bacteriological testing is to be performed at the nearest available hospital that is able to perform the tests. Transportation of samples is at Contractor's expense.

3.8 Disinfection

- .1 If the initial disinfection fails to produce satisfactory bacteriological samples, the main or tank may be refushed and resampled.
- .2 If check samples show the presence of cloiform organisms, then the main or tank shall be re-disinfected until satisfactory results are obtained.
- .3 All costs associated with the re-disinfection and testing shall be borne by the Contractor.

3.9 Placing Into Service

- .1 No piping, structure or tank that is required to be disinfected shall be placed into service until bacteriological samples indicate the absence of contamination.

END OF SECTION

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Equipment Specification Sheet

Client	Government of Nunavut		Device Name	Water Storage Tank	
Project	Water Works and Water Supply, WTP		Device location	Tank Room	
Project Number	02-0602		Tag No		
Total Capacity	406 m3		Tank Code	BSD.8.7.4	
Tank Size	9.76 m x 8.54 m x 4.88 m		Plate Size	1.22 m	
Number of cells	2	Equal size	Standard Plate thickness	5 & 6 m	
			Roof Plate thickness	3 mm	
			Flanges	External	
Fittings			Coating	Shop installed galvanizing	
Manhole	460 mm	2 each			
Roof Vent	150 mm	2 each			
Internal ladder	4880 mm high	2 each			
External Ladder	5.34 m high	2 each			
Inlet	100mm	2 each			
Outlet	100 mm	2 each			
Overflows	100 mm	2 each			
Drains	100 mm	2 each			
Notes;			Standard of Acceptance;		
Nominal capacity is 396,876 litres. Supply with all necessary stays, bolts, cleats, nuts and jointing compounds			Braithwaite Engineers Limited Neptune Works, Uskway Newport South Wales, UK Phone +44 (0) 1633-262141 Fax +44 (0) 1633-250631		

DILLON CONSULTING LIMITED						
Equipment Specification Sheet						
Client Project Project Number	Government of Nunavut Water Works and Water Supply, WTP 02-0602		Device Name		GAC Pressure Filter	
			Device location		Process Room	
			Tag No			
Bed Area each tank	2.62 m2		Inflow design rate	210 l/min		
Tank Size (each)	1.829 m diameter x 1.524 m straight wall height		Maximum inflow rate	310 l/min		
Number of tanks	2	Equal size	Design backwash rate	400 l/m/m2		
			Backwash duration	8 minutes		
			Backwash volume	9,072 l		
<u>Fittings per Tank</u>		<u>Supporting Bed</u>				
Manhole	300 x 400 mm	Graveless under-drain system designed for aircour				
Influent Valves	100 mm	Media Type	Effective Size, mm	Uniform Coefficient	Specific Gravity	Depth mm
Backwash Valves	100 mm	Angular Filter Sand	0.35 – 0.45	<1.5	2.65	605
Effluent Valves	100 mm	Topping Filter Sane	0.80 – 0.90	<1.5	1.4	305
Filter Waste Valves	100 mm					
Drain valves	62 mm					
Airwash Valves	62 mm					
Control Valves	Section 13110	Butterfly	Water tight control at maximum design pressure			
Actuator			120 V, 60 Hz			
Manual Valves	Section 13110	Butterfly				
Loss of Head Guages	General Filter #4879 guage		Total 2	Mount of cast aluminium nameplate installed on influent & effluent header piping		
<u>Back wash Cycle Control</u>						
Fully automated. Backwash to be in sequence and allow other tank to process water.						
Controls to allow for full automatic operation based on pressure drop across filter bed, and fully manual operation.						
Control panel to be a NEMA 12 wall mounted control cabinet containing programable controller, a non volatile memory module, and relays all shop wired and tested prior to shipping.						

Notes;

Supply with all controls, valves, air compressors, etc to provide working package plant

Filter under drain system consisting of rigid supported plate extending over the entire bottom of the filter area. Openings shall have non clogging stainless steel screens.

Standard of Acceptance;

USFilter Pressure Filtration Data Sheet D-22.00.

Alternatives must have;

- 1) list of 10 installations of similar equipment
- 2) Evidence of technical capability to design and check out the completeness of the system include all modifications to the design.
- 3) Evidence of financial responsibility to adequately complete the works and ensure viability to warranty the installation.

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Equipment Specification Sheet

Client	Government of Nunavut	Device Name	Raw Water Pump 1
Project	Water Works and Water Supply, WTP	Device location	Intake piping
Project Number	02-0602	Tag No	RWP 1
Flow (nominal)	200 L/s	Pump Construction	
Flow Max	300 l/min	Type	Submersible
Total Head	30.0 m (80 ft)	Casing	Stainless Steel
Pipe Size	100 mm	Shaft	Stainless Steel
Motor	3.0 Hp	Impellers	Stainless Steel
RPM	3500		
Voltage	208		
Phase	3		
Liquid	Water		
Construction	Bronze-Fitted		
Notes:		Standard of Acceptance:	
		Grundfos 85530-2	

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Equipment Specification Sheet

Client	Government of Nunavut	Device Name	Treated Water Pump 1 & 2
Project	Water Works and Water Supply, WTP	Device location	Process Room
Project Number	02-0602	Tag No	TWP 1 & TWP 2
Flow min	1000 L/min	Pump Construction	
Flow Max	N/a	Type	Closed Coupled
Total Head	8.5 m (80 ft)	Casing	Cast iron
Pipe Size	100 mm	Shaft	Steel
Motor	3.0 Hp	Impellers	Bronze
RPM	17500	Shaft Seal	Self Flushing mechanical
Voltage	208	Suction Falnge	100 mm
Phase	3	Discharge Flange	75 mm
Liquid	Water		
Construction	Bronze-Fitted		
Notes:		Standard of Acceptance:	
		ITT Bell & Gossett 1531-3AB	

DILLON CONSULTING				INSTRUMENT LIST	
TITLE	INSTRUMENTATION LIST			DATE 20/03/03 REVISION 0	
CLIENT	GOVERNMENT OF NUNAVUT				
PROJECT	Gjoa Haven Water Treatment Plant				
PROJECT No.	02-0602-2000				
TAG NAME	ISA TAG		DESCRIPTION		REFERENCE
PLCs					
GHWTP - 0 -	PLC1	PLC	01	WATER TREATMENT PLANT PLC:	SIEMENS S7-300
TRUCK FILL AND FILTRATION SYSTEM					
GHWTP - 0 -	LS1	LS	1	LS1 LEVEL TRANSMITTER STORAGE TANK CELL 1	
GHWTP - 0 -	LS2	LS	2	LS2 LEVEL TRANSMITTER STORAGE TANK CELL 2,	
GHWTP - 0 -	LSH1	LSH	1	LEVEL FLOAT SWITCH, SEPTIC TANK HIGH LEVEL ALARM	
GHWTP - 0 -	LSH-2	LS	2	LEVEL FLOAT SWITCH, SEPTIC TANK HIGH LEVEL STATUS	
GHWTP - 0 -	FT1	FT	1	FLOW TRANSMITTER, RAW WATER FLOW	
GHWTP - 0 -	FT2	FT	2	FLOW TRANSMITTER, TRUCK FILL ARM 1	
GHWTP - 0 -	FT3	FT	3	FLOW TRANSMITTER, TRUCK FILL ARM 2	
GHWTP - 0 -	CLM-1	AIT	1	CHLORINE TRANSMITTER	
GHWTP - 0 -	TURB-1	AIT	2	TURBIDITY TRANSMITTER	
GHWTP - 0 -	TS1	TS	1	TS1 TEMPERATURE TRANSMITTER, STORGE TANK	
GHWTP - 0 -	MV7	MV	7	MV7 VALVE ACTUATOR	
GHWTP - 0 -	MV8	MV	8	MV8 VALVE ACTUATOR	
GHWTP - 0 -	MV9	MV	9	MV9 VALVE ACTUATOR	
GHWTP - 0 -	SV1	SV	1	SV1 TRUCK FILL SOLENOID DRAIN VALVE	
GHWTP - 0 -	TSLO1	TSL	01	TSLO1 THERMOSTAT, LOW TEMPERATURE PUMP ROOM	
GHWTP - 0 -	TSLO2	TSL	02	TSLO2 THERMOSTAT, LOW TEMPERATURE TANK ROOM	
GHWTP - 0 -	TSU/TS-3	TSL/TS-3	03	TSLO3 THERMOSTAT, LOW/HIGH TEMPERATURE GENERATOR ROOM	

SIEMENS S7-300

Gjoa Haven Water Treatment Plant
Government of Nunavut

Water Treatment Plant
PLC POINTS LIST

DILLON
Consulting

Project : 02-0502-2000
Date : February 24, 2003
File Name : POINT_LT.WK4
Rev

Equipment Tagname LLLL - S - PPP - EEEE - CCC	Point Name/Description	Signal Type	ISA Tag EEE - ###	I/O Address PLC : Rack : Slot : Type : Point	Ref. Address	PLC Module Product Number	Terminals From To
	POWER SUPPLY			1 : 1 : :		PS307	
	PLC			1 : 1 : 0 :		SIMATIC S7-300 CPU 312C	
	Operator Interface					OP-270	
GHWTP - - - TWP1 - REM	TRUCK FILL PUMP TWP1 REMOTE STATUS	DI		1 : 1 : 1 : DI : 2		6ES7 321-1EL00-0AA0	
GHWTP - - - TWP1 - STS	TRUCK FILL PUMP TWP1 RUN STATUS	DI		1 : 1 : 1 : DI : 3		6ES7 321-1EL00-0AA0	
GHWTP - - - TWP1 - OL	TRUCK FILL PUMP TWP1 FAULT ALARM	DI		1 : 1 : 1 : DI : 4		6ES7 321-1EL00-0AA0	
GHWTP - - - TWP1 - EN	TRUCK FILL PUMP TWP1 MOTOR ENABLE	DI		1 : 1 : 1 : DI : 5		6ES7 321-1EL00-0AA0	
GHWTP - - - TWP2 - REM	TRUCK FILL PUMP TWP2 REMOTE STATUS	DI		1 : 1 : 1 : DI : 6		6ES7 321-1EL00-0AA0	
GHWTP - - - TWP2 - STS	TRUCK FILL PUMP TWP2 RUN STATUS	DI		1 : 1 : 1 : DI : 7		6ES7 321-1EL00-0AA0	
GHWTP - - - TWP2 - OL	TRUCK FILL PUMP TWP2 FAULT ALARM	DI		1 : 1 : 1 : DI : 8		6ES7 321-1EL00-0AA0	
GHWTP - - - TWP2 - EN	TRUCK FILL PUMP TWP2 MOTOR ENABLE	DI		1 : 1 : 1 : DI : 9		6ES7 321-1EL00-0AA0	
GHWTP - - - RWP1 - REM	INTAKE PUMP RWP1 REMOTE STATUS	DI		1 : 1 : 1 : DI : 12		6ES7 321-1EL00-0AA0	
GHWTP - - - RWP1 - STS	INTAKE PUMP RWP1 RUN STATUS	DI		1 : 1 : 1 : DI : 13		6ES7 321-1EL00-0AA0	
GHWTP - - - RWP1 - OL	INTAKE PUMP RWP1 FAULT ALARM	DI		1 : 1 : 1 : DI : 14		6ES7 321-1EL00-0AA0	
GHWTP - - - RWP1 - EN	INTAKE PUMP RWP1 MOTOR ENABLE	DI		1 : 1 : 1 : DI : 15		6ES7 321-1EL00-0AA0	
GHWTP - - - RWP1 - FLT	INTAKE PUMP RWP1 GROUND FAULT	DI		1 : 1 : 1 : DI : 16		6ES7 321-1EL00-0AA0	
GHWTP - - - 120VAC - EN	PLC 120VAC POWER ENABLE	DI		1 : 1 : 1 : DI : 17		6ES7 321-1EL00-0AA0	
GHWTP - - - UPS01 - EN	PLC POWER ENABLE	DI		1 : 1 : 1 : DI : 18		6ES7 321-1EL00-0AA0	
GHWTP - - - TWP4 - REM	BACKWASH PUMP PFBWP1 REMOTE STATUS	DI		1 : 1 : 1 : DI : 19		6ES7 321-1EL00-0AA0	
GHWTP - - - TWP4 - STS	BACKWASH PUMP PFBWP1 RUN STATUS	DI		1 : 1 : 1 : DI : 22		6ES7 321-1EL00-0AA0	
GHWTP - - - TWP4 - OL	BACKWASH PUMP PFBWP1 FAULT ALARM	DI		1 : 1 : 1 : DI : 23		6ES7 321-1EL00-0AA0	
GHWTP - - - TWP4 - EN	BACKWASH PUMP PFBWP1 MOTOR ENABLE	DI		1 : 1 : 1 : DI : 24		6ES7 321-1EL00-0AA0	
	SPARE	DI		1 : 1 : 1 : DI : 25		6ES7 321-1EL00-0AA0	
	SPARE	DI		1 : 1 : 1 : DI : 26		6ES7 321-1EL00-0AA0	
	SPARE	DI		1 : 1 : 1 : DI : 27		6ES7 321-1EL00-0AA0	
	SPARE	DI		1 : 1 : 1 : DI : 28		6ES7 321-1EL00-0AA0	
	SPARE	DI		1 : 1 : 1 : DI : 29		6ES7 321-1EL00-0AA0	
	SPARE	DI		1 : 1 : 1 : DI : 32		6ES7 321-1EL00-0AA0	
	SPARE	DI		1 : 1 : 1 : DI : 33		6ES7 321-1EL00-0AA0	
	SPARE	DI		1 : 1 : 1 : DI : 34		6ES7 321-1EL00-0AA0	
	SPARE	DI		1 : 1 : 1 : DI : 35		6ES7 321-1EL00-0AA0	
	SPARE	DI		1 : 1 : 1 : DI : 36		6ES7 321-1EL00-0AA0	
	SPARE	DI		1 : 1 : 1 : DI : 37		6ES7 321-1EL00-0AA0	
	SPARE	DI		1 : 1 : 1 : DI : 38		6ES7 321-1EL00-0AA0	
	SPARE	DI		1 : 1 : 1 : DI : 39		6ES7 321-1EL00-0AA0	
GHWTP - - - TWP3 - ALM	DOMESTIC WATER TANK LOW LEVEL ALARM	DI		1 : 1 : 2 : DI : 2		6ES7 321-1BL80-0AA0	
GHWTP - - - MV7 - OPD	MOTORIZED VALVE MV7 OPENED	DI		1 : 1 : 2 : DI : 3		6ES7 321-1BL80-0AA0	
GHWTP - - - MV7 - CLD	MOTORIZED VALVE MV7 CLOSED	DI		1 : 1 : 2 : DI : 4		6ES7 321-1BL80-0AA0	
GHWTP - - - MV7 - REM	MOTORIZED VALVE MV7 REMOTE STATUS	DI		1 : 1 : 2 : DI : 5		6ES7 321-1BL80-0AA0	
GHWTP - - - MV8 - OPD	MOTORIZED VALVE MV8 OPENED	DI		1 : 1 : 2 : DI : 6		6ES7 321-1BL80-0AA0	
GHWTP - - - MV8 - CLD	MOTORIZED VALVE MV8 CLOSED	DI		1 : 1 : 2 : DI : 7		6ES7 321-1BL80-0AA0	
GHWTP - - - MV8 - REM	MOTORIZED VALVE MV8 REMOTE STATUS	DI		1 : 1 : 2 : DI : 8		6ES7 321-1BL80-0AA0	
GHWTP - - - MV9 - OPD	MOTORIZED VALVE MV9 OPENED	DI		1 : 1 : 2 : DI : 9		6ES7 321-1BL80-0AA0	
GHWTP - - - MV9 - CLD	MOTORIZED VALVE MV9 CLOSED	DI		1 : 1 : 2 : DI : 12		6ES7 321-1BL80-0AA0	
GHWTP - - - MV9 - REM	MOTORIZED VALVE MV9 REMOTE STATUS	DI		1 : 1 : 2 : DI : 13		6ES7 321-1BL80-0AA0	
GHWTP - - - SV1 - OPD	SOLENOID VALVE SV1 OPENED	DI		1 : 1 : 2 : DI : 14		6ES7 321-1BL80-0AA0	
	SPARE	DI		1 : 1 : 2 : DI : 15		6ES7 321-1BL80-0AA0	
GHWTP - - - 24VDC - EN	PLC 24VDC NORMAL POWER ENABLE	DI		1 : 1 : 2 : DI : 16		6ES7 321-1BL80-0AA0	
GHWTP - - - TSL01 - ALM	LOW TEMPERATURE PUMP ROOM ALARM	DI		1 : 1 : 2 : DI : 17		6ES7 321-1BL80-0AA0	
GHWTP - - - TSL02 - ALM	TANK ROOM LOW TEMPERATURE ALARM	DI		1 : 1 : 2 : DI : 18		6ES7 321-1BL80-0AA0	
GHWTP - - - TSL03 - ALM	GENERATOR ROOM LOW TEMPERATURE ALARM	DI		1 : 1 : 2 : DI : 19		6ES7 321-1BL80-0AA0	
GHWTP - - - TSH03 - ALM	GENERATOR ROOM HIGH TEMPERATURE ALARM	DI		1 : 1 : 2 : DI : 22		6ES7 321-1BL80-0AA0	
GHWTP - - - HT01 - ALM	HEAT TRACE 1 FAULT ALARM	DI		1 : 1 : 2 : DI : 23		6ES7 321-1BL80-0AA0	

Gjoa Haven Water Treatment Plant

Government of Nunavut

Water Treatment Plant

PLC POINTS LIST

DILLON

Consulting

Project : 02-0602-2000

Date : February 24, 2003

File Name : POINT_LT_WK4

Remarks :

Equipment Tagname	Point Name/Description	Signal Type	ISA Tag EEE	##	I/O Address	Ref. Address	PLC Module	Terminals
LLL	PP	EEEE	CCC					From To
GHWTP -	-	-	-	-	HEAT TRACE 2 FAULT ALARM	DI	6ES7 321-1BL80-0AA0	
GHWTP -	-	-	-	-	TRUCK FILL PATCH CONTROLLER TFC1 STOP	DI	6ES7 321-1BL80-0AA0	
GHWTP -	-	-	-	-	TRUCK FILL PATCH CONTROLLER TFC1 START	DI	6ES7 321-1BL80-0AA0	
GHWTP -	-	-	-	-	PATCH CONTROLLER TFC1 KEY SWITCH STATUS	DI	6ES7 321-1BL80-0AA0	
GHWTP -	-	-	-	-	TRUCK FILL PATCH CONTROLLER TFC2 STOP	DI	6ES7 321-1BL80-0AA0	
GHWTP -	-	-	-	-	TRUCK FILL PATCH CONTROLLER TFC2 START	DI	6ES7 321-1BL80-0AA0	
GHWTP -	-	-	-	-	PATCH CONTROLLER TFC2 KEY SWITCH STATUS	DI	6ES7 321-1BL80-0AA0	
GHWTP -	-	-	-	-	SEPTIC TANK HIGH LEVEL MAJOR ALARM	DI	6ES7 321-1BL80-0AA0	
GHWTP -	-	-	-	-	SEPTIC TANK HIGH LEVEL	DI	6ES7 321-1BL80-0AA0	
GHWTP -	-	-	-	-	LT1 LOSS OF ECHO ALARM	DI	6ES7 321-1BL80-0AA0	
GHWTP -	-	-	-	-	LT2 LOSS OF ECHO ALARM	DI	6ES7 321-1BL80-0AA0	
GHWTP -	-	-	-	-	SPARE	DI	6ES7 321-1BL80-0AA0	
GHWTP -	-	-	-	-	FILTER SYSTEM ON STATUS	DI	6ES7 321-1BL80-0AA0	
GHWTP -	-	-	-	-	BACKWASH ON STATUS	DI	6ES7 321-1BL80-0AA0	
GHWTP -	-	-	-	-	FILTER SYSTEM FAULT ALARM	DI	6ES7 321-1BH82-0AA0	
GHWTP -	-	-	-	-	GENERATOR RUN STATUS	DI	6ES7 321-1BH82-0AA0	
GHWTP -	-	-	-	-	GENERATOR AUTO MODE	DI	6ES7 321-1BH82-0AA0	
GHWTP -	-	-	-	-	GENERATOR FAULT ALARM	DI	6ES7 321-1BH82-0AA0	
GHWTP -	-	-	-	-	HYDRO POWER FAILURE	DI	6ES7 321-1BH82-0AA0	
GHWTP -	-	-	-	-	AUTO TRANSFER SWITCH SELECTOR AUTO MODE	DI	6ES7 321-1BH82-0AA0	
GHWTP -	-	-	-	-	CLD	DI	6ES7 321-1BH82-0AA0	
GHWTP -	-	-	-	-	FUEL	DI	6ES7 321-1BH82-0AA0	
GHWTP -	-	-	-	-	SPARE	DI	6ES7 321-1BH82-0AA0	
GHWTP -	-	-	-	-	SPARE	DI	6ES7 321-1BH82-0AA0	
GHWTP -	-	-	-	-	SPARE	DI	6ES7 321-1BH82-0AA0	
GHWTP -	-	-	-	-	SPARE	DI	6ES7 321-1BH82-0AA0	
GHWTP -	-	-	-	-	SPARE	DI	6ES7 321-1BH82-0AA0	
GHWTP -	-	-	-	-	SPARE	DI	6ES7 321-1BH82-0AA0	
GHWTP -	-	-	-	-	TRUCK FILL PUMP TWP1 STOP COMMAND	DO	6ES7 322-1BL00-0AA0	
GHWTP -	-	-	-	-	TRUCK FILL PUMP TWP1 START COMMAND	DO	6ES7 322-1BL00-0AA0	
GHWTP -	-	-	-	-	TRUCK FILL PUMP TWP2 STOP COMMAND	DO	6ES7 322-1BL00-0AA0	
GHWTP -	-	-	-	-	TRUCK FILL PUMP TWP2 START COMMAND	DO	6ES7 322-1BL00-0AA0	
GHWTP -	-	-	-	-	INTAKE PUMP RWP1 STOP COMMAND	DO	6ES7 322-1BL00-0AA0	
GHWTP -	-	-	-	-	INTAKE PUMP RWP1 START COMMAND	DO	6ES7 322-1BL00-0AA0	
GHWTP -	-	-	-	-	SPARE	DO	6ES7 322-1BL00-0AA0	
GHWTP -	-	-	-	-	SPARE	DO	6ES7 322-1BL00-0AA0	
GHWTP -	-	-	-	-	TWP's LOCK OUT RELAY	DO	6ES7 322-1BL00-0AA0	
GHWTP -	-	-	-	-	SPARE	DO	6ES7 322-1BL00-0AA0	
GHWTP -	-	-	-	-	DOMESTIC WATER TANK STOP COMMAND	DO	6ES7 322-1BL00-0AA0	
GHWTP -	-	-	-	-	MOTORIZED VALVE MV7 OPEN COMMAND	DO	6ES7 322-1BL00-0AA0	
GHWTP -	-	-	-	-	MOTORIZED VALVE MV7 CLOSE COMMAND	DO	6ES7 322-1BL00-0AA0	
GHWTP -	-	-	-	-	MOTORIZED VALVE MV8 OPEN COMMAND	DO	6ES7 322-1BL00-0AA0	
GHWTP -	-	-	-	-	MOTORIZED VALVE MV8 CLOSE COMMAND	DO	6ES7 322-1BL00-0AA0	
GHWTP -	-	-	-	-	MOTORIZED VALVE MV9 OPEN COMMAND	DO	6ES7 322-1BL00-0AA0	
GHWTP -	-	-	-	-	MOTORIZED VALVE MV9 CLOSE COMMAND	DO	6ES7 322-1BL00-0AA0	
GHWTP -	-	-	-	-	SOLENOID VALVE SV1 OPEN COMMAND	DO	6ES7 322-1BL00-0AA0	
GHWTP -	-	-	-	-	SEPTIC TANK HIGH LEVEL ALARM LIGHT	DO	6ES7 322-1BL00-0AA0	
GHWTP -	-	-	-	-	CHLORINE INJECTION PUMP CMP1 RUN COMMAND	DO	6ES7 322-1BL00-0AA0	
GHWTP -	-	-	-	-	CHLORINE INJECTION PUMP CMP2 RUN COMMAND	DO	6ES7 322-1BL00-0AA0	
GHWTP -	-	-	-	-	INHIBIT BACKWASH	DO	6ES7 322-1BL00-0AA0	
GHWTP -	-	-	-	-	SPARE	DO	6ES7 322-1BL00-0AA0	
GHWTP -	-	-	-	-	SPARE	DO	6ES7 322-1BL00-0AA0	

Equipment Tagname						Point Name/Description		Signal Type	ISA Tag EEE - ###	I/O Address PLC : Rack : Slot : Type - Point		Ref. Address	PLC Module Product Number	Terminals From To		Remarks	File Name : POINT_LT.WK4
LULL	S	PPP	EEEE	CCC													
-	-	-	-	-		SPARE	DO			1 : 1 : 4 : DO : 33			6ES7 322-1BL00-0AA0				
-	-	-	-	-		SPARE	DO			1 : 1 : 4 : DO : 34			6ES7 322-1BL00-0AA0				
-	-	-	-	-		SPARE	DO			1 : 1 : 4 : DO : 35			6ES7 322-1BL00-0AA0				
-	-	-	-	-		SPARE	DO			1 : 1 : 4 : DO : 36			6ES7 322-1BL00-0AA0				
-	-	-	-	-		SPARE	DO			1 : 1 : 4 : DO : 37			6ES7 322-1BL00-0AA0				
-	-	-	-	-		SPARE	DO			1 : 1 : 4 : DO : 38			6ES7 322-1BL00-0AA0				
-	-	-	-	-		SPARE	DO			1 : 1 : 4 : DO : 39			6ES7 322-1BL00-0AA0				
-	-	-	-	-		TANK CELL 1 WATER LEVEL	AI	LT - 1		1 : 0 : 5 : AI : A			6ES7 333-7KF01-0AB0				
-	-	-	-	-		TANK CELL 2 WATER LEVEL	AI	LT - 2		1 : 0 : 5 : AI : B			6ES7 333-7KF01-0AB0				
-	-	-	-	-		TURBIDITY METER	AI	AIT - 2		1 : 0 : 5 : AI : C			6ES7 333-7KF01-0AB0				
-	-	-	-	-		TANK CELL 1 WATER TEMPERATURE	AI	TS - 1		1 : 0 : 5 : AI : D			6ES7 333-7KF01-0AB0				
-	-	-	-	-		RAW WATER INFLUENT FLOW/TOTALIZER	AI	FT - 1		1 : 0 : 5 : AI : E			6ES7 333-7KF01-0AB0				
-	-	-	-	-		TRUCK FILL 1 FLOW/TOTALIZER	AI	FT - 2		1 : 0 : 5 : AI : F			6ES7 333-7KF01-0AB0				
-	-	-	-	-		TRUCK FILL 2 FLOW/TOTALIZER	AI	FT - 3		1 : 0 : 5 : AI : G			6ES7 333-7KF01-0AB0				
-	-	-	-	-		CLORINE METER	AI	AIT 1		1 : 0 : 5 : AI : H			6ES7 333-7KF01-0AB0				

TITLE CLIENT PROJECT		DILLON CONSULTING WATER TREATMENT PLANT PLC GOVERNMENT OF NUNAVUT GJOA HAVEN WATER TREATMENT PLANT				PROGRAMMABLE LOGIC CONTROLLER			
						EQUIPMENT NO. GJWTP-PLC01		REVISION 0	
PROJECT No. 02-0602									
SITE CONDITIONS		Indoor ☒	X	Heated	X	Remarks:			
		Outdoor ☐		Unheated					
				QUANTITY		PART No.		REMARKS	
PLC	Processor		1		6ES7 312-5BD00-0AB0				
	Memory MMC		1		6ES7 953-8LF00-0AA0				
	I/O Rack		1		6ES7 380-1AJ30-0AA0				
	Expansion I/O Chassis.		0						
	Remote I/O Chassis.		0						
	Front Interconnect Cable		AS REQUIRED				AS REQUIRED		
	Operator Interface (HMI)		1		OP-270				
POWER SUPPLY	Power 120 VAC								
	Power Supply Module (Base)		1		PS 307				
	Power Supply Module (Expansion)		0						
INPUT / OUTPUT	Digital Input (Isolated) 32 pt. 120 VAC		1		6ES7 321-1EL00-0AA0				
	Digital Output (Isolated) 8 pt. 120 VAC		0						
	Digital Input 32 pt 24 VDC		2		6ES7 321-1BL80-0AA0				
	Digital Input 16 pt 24 VDC		1		6ES7 321-1BH82-0AA0				
	Digital Output 32 pt. 32 VDC		1		6ES7 322-1BL00-0AA0				
	Input Analog 4 - 20 mA		2		6ES7 333-7KF01-0AB0				
	Output Analog 4 - 20 mA		0						
COMMUNICATION	Ethernet Communication Module		1		TELEPHONE INTERFACE				
	Buss Transmitter		1						
	Genius Buss Controller		2						
REMARKS: 1 Contractor to modify and add wiring to provide inputs and outputs as indicated on the points list. 2 Confirm all details ,sizing and quantities before ordering 3 Spares to Sectin 17000 4 Software SOA Siemens									
Manufacturer		Model.		Spec By		acn		REVISION	
siemens		ST-70		Checked				No.	Date
				Approved					
				Date		March 24, 2003			

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TITLE CLIENT PROJECT PROJECT No.		DILLON CONSULTING STORAGE CELL 1 LEVEL TRANSMITTER THE GOVERNMENT OF NUNAVUT P W & S WATER WORKS AND WATER SUPPLY WATER TREATMENT PLANT - CONTRACT 1 02-0602				LEVEL INDICATING TRANSMITTER ULTRASONIC			
		TAG No. GHWTP-LIT1		REVISION					
SITE CONDITIONS		Indoor ☒	X	Heated ☐	X	Remarks: CONTROL RWP1 FAULT ALARM (SEE NOTE 4)			
SERVICE		Name:		WATER		OPTIONS:			
		Vessel Type		FRP					
		Elevation							
		Minimum		0 m					
		Maximum		NOTE 3 m					
		Temperature							
		Minimum		15 C					
		Maximum		30 C					
		Pressure							
		Minimum		Atmos. kPa					
Maximum		Atmos. kPa							
ELEMENT		Type		Ultrasonic		CALIBRATION			
		Beam Angle		6 Deg.					
		Mounting		Flanged					
		Process Connection							
		Flanged		150 mm					
		Threaded		mm					
		Material							
		Housing		PVDF					
		Facing		PVDF					
		Temp. Compensation		X YES No					
		Self Cleaning		YES X No					
		Immersion		YES X No					
		Cable Length		X m					
		Area Classification		C: Z: G:					
Enclosure Rating		NEMA 4							
Notes:									
TRANSMITTER		Type:		Miniranger Plus		NOTES: - Confirm all details and sizing before ordering. - Provide one Hand Programmer for each Millitronic transmitter. - Calibration range will be measured in the field, range will be 4mA at the bottom of tank and 20mA at the invert of overflow nozzle. - HIGH LEVEL ALARM - LEVEL 1 TRUCK FILL PUMP OFF - LEVEL 2 PUMP ON - LEVEL 3 LOW ALARM MINOR - LEVEL 4 LOW ALARM MAJOR, LOCK OUT TRUCK FILL PUMP - LEVEL 5 LOW LOW LEVEL, INHIBIT BACKWASH - LEVEL 6 - TRUCK FILL PUMPS LEAD LAG OPERATION, ONLY ONE PUMP WILL BE ON AT ANY ONE TIME. - Alarm contacts to PLC			
		Power Supply		120 VAC					
		Output		4-20 mA					
		No. of Transducers Inputs		1					
		Indication							
		Type		Digital LCD					
		Units		%					
		Range		0-100					
		Relay							
		Number		2					
		Contact Type		Form "C" SPDT					
		Rating		15 VA @ 120 VAC					
		Fail Safe		Open					
		Accuracy		0.25% of FSD					
		Resolution		2 mm over Full Range					
		Response Time		0.1 to 1020 m/min					
		Approvals		CSA					
		Area Classification		C: Z: G:					
		Enclosure Rating		NEMA 4X					
		Notes:							
Manufacturer		Model No.		Spec By		REVISION			
Millitronic (LE-01)		XPS-15		ACN		No.	Date	By	
Millitronic (LT-1)		MiniRanger Plus		GS					
				Date					

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REV. 11/96

TITLE CLIENT PROJECT PROJECT No.		DILLON CONSULTING STORAGE CELL 1 LEVEL TRANSMITTER THE GOVERNMENT OF NUNAVUT P W & S WATER WORKS AND WATER SUPPLY WATER TREATMENT PLANT - CONTRACT 1 02-0602				LEVEL INDICATING TRANSMITTER ULTRASONIC															
		Indoor ☒ Heated Outdoor ☐ Unheated		X ☒		TAG No. GHWTP-LIT2		REVISION													
SITE CONDITIONS		Name: WATER Vessel Type: FRP Elevation: Minimum: 0 m Maximum: NOTE 3 m Temperature: Minimum: 15 C Maximum: 30 C Pressure: Minimum: Atmos. kPa Maximum: Atmos. kPa				Remarks: CONTROL RWP1 FAULT ALARM (SEE NOTE 4)															
SERVICE						OPTIONS															
						Calibrator ☐ YES ☒ NO Flow Calculation ☐ YES ☒ NO Isolator Bushing ☐ YES ☒ NO Submersible Collar ☐ YES ☒ NO Hand Programmer ☒ YES ☐ NO 316 S.S. Tag ☒ YES ☐ NO Dolphin Interface ☒ YES ☐ NO															
ELEMENT		Type: Ultrasonic Beam Angle: 6 Deg. Mounting: Flanged Process Connection: Flanged: 150 mm Threaded: mm Material: Housing: PVDF Facing: PVDF Temp. Compensation: X YES ☐ No Self Cleaning: YES ☒ X No Immersion: YES ☒ X No Cable Length: X m Area Classification: C: Z: G: Enclosure Rating: NEMA 4 Notes:				CALIBRATION															
						Range: 20 mA: NOTE 3 mm 4 mA: 0 mm Notes: To be calibrated in the field.															
TRANSMITTER		Type: Miniranger Plus Power Supply: 120 VAC Output: 4-20 mA No. of Transducers Inputs: 1 Indication: Type: Digital LCD Units: % Range: 0-100 Relay: Number: 2 Contact Type: Form "C" SPDT Rating: 15 VA @ 120 VAC Fail Safe: Open Accuracy: 0.25% of FSD Resolution: 2 mm over Full Range Response Time: 0.1 to 1020 m/min Approvals: CSA Area Classification: C: Z: G: Enclosure Rating: NEMA 4X Notes:				NOTES: - Confirm all details and sizing before ordering. - Provide one Hand Programmer for each Milltronic transmitter. - Calibration range will be measured in the field, range will be 4mA at the bottom of tank and 20mA at the invert of overflow nozzle. - HIGH LEVEL ALARM - LEVEL 1 TRUCK FILL PUMP OFF - LEVEL 2 PUMP ON - LEVEL 3 LOW ALARM MINOR - LEVEL 4 LOW ALARM MAJOR, LOCK OUT TRUCK FILL PUMP - LEVEL 5 LOW LOW LEVEL, INHIBIT BACKWASH - LEVEL 6 - TRUCK FILL PUMPS LEAD LAG OPERATION, ONLY ONE PUMP WILL BE ON AT ANY ONE TIME. - Alarm contacts to PLC															
Manufacturer: Milltronic (LE-01) Milltronic (LT-1)		Model No.: XPS-15 MiniRanger Plus		Spec By: ACN Checked: Approved: GS Date: FEB. 11, 2003		REVISION <table border="1"> <thead> <tr> <th>No.</th> <th>Date</th> <th>By</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>				No.	Date	By									
No.	Date	By																			

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REV. 11/96

TITLE CLIENT PROJECT PROJECT No.		DILLON CONSULTING RAW WATER FLOW TRANSMITTER THE GOVERNMENT OF NUNAVUT P W & S WATER WORKS AND WATER SUPPLY WATER TREATMENT PLANT - CONTRACT 1 02-0602				FLOW INDICATING TRANSMITTER MAGNETIC			
		TAG No. GHWTP - FT1		REVISION 0					
SITE CONDITIONS		Indoor ☒	Heated ☒	Outdoor ☐		Unheated ☐		Remarks: MEASURE RAW WATER INFLOW	
SERVICE		Name: Water		Temperature		Minimum 0 deg. C.		Maximum 20 deg. C.	
		Flowrate		Pressure		Minimum 0 kPa		Maximum 700 kPa	
		Normal 200 l/min		Conductivity		Minimum Micro-mhos		Maximum Micro-mhos	
		Minimum 0 l/min							
		Maximum 300 l/min							
		Specific Gravity @ deg. C.							
		Viscosity kPa @ deg. C.							
ELEMENT		Process Connection		Calibrator		☒ YES		☐ NO	
		Line Size 100 mm		Totalizer		☒ YES		☐ NO	
		Line Material Ductile		Lifting Lugs		☒ YES		☐ NO	
		Type Flange ☒ Thread		Grounding Rings		☐ YES		☒ NO	
		Rating 150 lbs		316 S.S. Tag		☒ YES		☐ NO	
		Meter		Cable Length		Contractor to Verify		m	
		Tube Material 304 SS							
		Liner material Polyurethane							
		Electrode Type DC Pulse Bullet Nose							
		Electrode Material 316 S.S.							
		Body Material Carbon Steel							
		Connection Flanged							
		Type 150 # ANSI							
		Size 40 mm							
		Submergence ☒ YES ☐ NO		CALIBRATION		Range		20 mA 55.2 MLD	
Enclosure Rating IP68 / NEMA 6				4 mA 0 MLD					
Notes:				Notes: To be calibrated in the field.					
TRANSMITTER		Remote Converter ☒ YES ☐ NO		NOTES: 1. Confirm all details and sizing before ordering. 2. MONITOR RAW WATE FLOW RATE AND TOTALIZW INFLOW					
		Mounting PLC CABINET							
		Power Supply 24 Vdc							
		Output 4-20 mA							
		Isolated Output ☒ YES ☐ NO							
		Range							
		Minimum 0 l/min							
		Maximum 300 l/min							
		Indication							
		Type Digital LCD							
		Units m3/h							
		Range 0-1000							
		Accuracy 1% of full sendor scale							
		Repeatability 0.5% of full range							
		Damping							
RIF Shield ☐ YES ☒ NO									
Approvals CSA									
Area Classification C: NON G: * D: *									
Enclosure Rating NEMA 4X/ IP65									
Notes:									
Manufacturer		Model No.		Spec By ACN		REVISION			
GF Signet		3-8550-1P		Checked		No. Date By			
				Approved GS					
				Date FEB. 11, 2003					

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TITLE CLIENT PROJECT PROJECT No.		DILLON CONSULTING TREATED WATER FLOW TRANSMITTER THE GOVERNMENT OF NUNAVUT P W & S WATER WORKS AND WATER SUPPLY WATER TREATMENT PLANT - CONTRACT 1 02-0602				FLOW INDICATING TRANSMITTER MAGNETIC			
		TAG No. GHWTP - FT2		REVISION 0					
SITE CONDITIONS		Indoor ☐ X Outdoor ☐	Heated ☐ X Unheated ☐	Remarks: FE is mounted on the TruckFill Arm 1 FT2 is mounted on the door of the PLC cabinet					
SERVICE		Name: Water Flowrate: Normal 1,000 l/min Minimum 0 l/min Maximum 1,500 l/min Specific Gravity @ deg. C. Viscosity kPa @ deg. C.		SERVICE					
ELEMENT		Process Connection Line Size 100 mm Line Material Ductile Type Flange X Thread Rating 150 lbs Meter Tube Material 316 SS Liner material Polyurethane Electrode Type DC Pulse Bullet Nose Electrode Material 316 S.S. Body Material Carbon Steel Connection Flanged Type 150 # ANSI Size 40 mm Submergence X YES NO Enclosure Rating IP68 / NEMA 6 Notes:		OPTIONS					
TRANSMITTER		Remote Converter X YES NO Mounting Wall Power Supply 120 VAC Output 4-20 mA Isolated Output X YES NO Range Minimum 0 l/min Maximum 2,000 l/min Indication Type Digital LCD Units l/min. Range 0-1000 Accuracy 1% of full sensor scale Repeatability 0.5% of full range Damping 4-95 sec. RIF Shield YES X NO Approvals CSA Area Classification C: NON G: * D: * Enclosure Rating NEMA 4X Notes:		CALIBRATION					
				Range 20 mA 300 L/min. 4 mA 0 L/min Notes: To be calibrated in the field.					
				NOTES:					
				1. Confirm all details and sizing before ordering. 2. c/w panel mounting bracket 3. MEASURE TRUCK FILL ARM 1 FLOW RATE BATCH CONTROL AND TOTALIZE OUTFLOW 4. ACTIVATE CHLORINE MTERING PUMP					
				REVISION					
Manufacturer		Model No.		Spec By ACN		No.			
GF+ Signet		3-8550-1P		Checked		Date			
2540		Approved		GS		By			
Date		FEB. 11, 2003		Date		By			

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TITLE CLIENT PROJECT PROJECT No.		DILLON CONSULTING TREATED WATER FLOW TRANSMITTER THE GOVERNMENT OF NUNAVUT P W & S WATER WORKS AND WATER SUPPLY WATER TREATMENT PLANT - CONTRACT 1 02-0602				FLOW INDICATING TRANSMITTER MAGNETIC			
						TAG No. GHWTP - FT3		REVISION 0	
SITE CONDITIONS		Indoor ☒ Outdoor ☐	X ☒ Heated ☐ Unheated ☒	Remarks: FE is mounted on the TruckFill Arm 2 FT2 is mounted on the door of the PLC cabinet					
SERVICE		Name: Water		SERVICE					
		Flowrate							
		Normal 1,000 MLD							
		Minimum 0 MLD							
		Maximum 1,500 MLD							
		Specific Gravity @ deg. C.							
Viscosity kPa @ deg. C.		OPTIONS							
Process Connection									
Line Size 100 mm									
Line Material Ductile									
Type Flange x Thread									
Rating 150 lbs									
ELEMENT		Meter		CALIBRATION					
		Tube Material 316 SS							
		Liner material Polyurethane							
		Electrode Type DC Pulse Bullet Nose							
		Electrode Material 316 S.S.							
		Body Material Carbon Steel							
		Connection Flanged							
		Type 150 # ANSI							
		Size 40							
		Submergence X YES NO							
Enclosure Rating IP68 / NEMA 6		NOTES: 1. Confirm all details and sizing before ordering. 2. c/w panel mounting bracket 3. MEASURE TRUCK FILL ARM 2 FLOW RATE BATCH CONTROL AND TOTALIZE OUTFLOW ACTIVATE CHLORINE MTERING PUMP							
Notes:									
Remote Converter X YES NO									
Mounting Wall									
Power Supply 120 VAC									
Output 4-20 mA									
Isolated Output X YES NO									
Range									
Minimum 0 l/min									
Maximum 2,000 l/min									
TRANSMITTER		Indication		REVISION					
		Type Digital LCD							
		Units l/min.							
		Range 0-1000							
		Accuracy 0.50 % of FSD							
		Repeatability 0.10 % of Full Scale							
		Damping 4-95 sec.							
		RIF Shield YES X NO							
		Approvals CSA							
		Area Classification C: NON G: * D: *							
Enclosure Rating NEMA 4X		No. Date By							
Notes:									
Manufacturer Model No. Spec By ACN									
GF+ Signet 3-8550-1P		Checked		Date FEB. 11, 2003					
2540		Approved							
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