

The Economic Advantages of Nonintrusive Flow Measurement

Labor Costs

Unlike other flowmeters that intrude into the line of flow, ultrasonic meters are nonintrusive and can be installed within an extremely short period of time. Welding, pipecutting and potential process downtime are totally eliminated.



Material Costs

The added costs of flanges, bolts and gaskets disappear. Ultrasonic flowmeters, when compared with electromagnetic and vortex systems, eliminate a substantial amount of mechanical components and the labor necessary to install them.

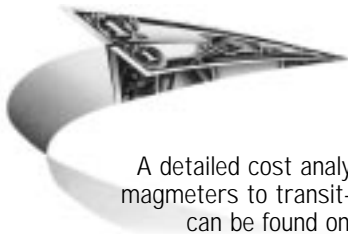


Cost of Ownership

Most engineers know of this in principal, but do not always factor the cost of ownership into the selection process. Hidden costs can rapidly accrue due to unscheduled shutdowns and short maintenance intervals. With nonintrusive flow measurement, clogging or corrosion is not a



potential problem. Since the field sensors are devoid of all moving mechanical components, the need for continuous recalibration is eliminated. With the auto-correction feature that is designed into the electronics, the meter will maintain a consistently accurate reading over changing conditions and time.



A detailed cost analysis comparing vortex and magmeters to transit-time ultrasonic flowmeters can be found on the following pages.

Vortex vs Ultrasonic

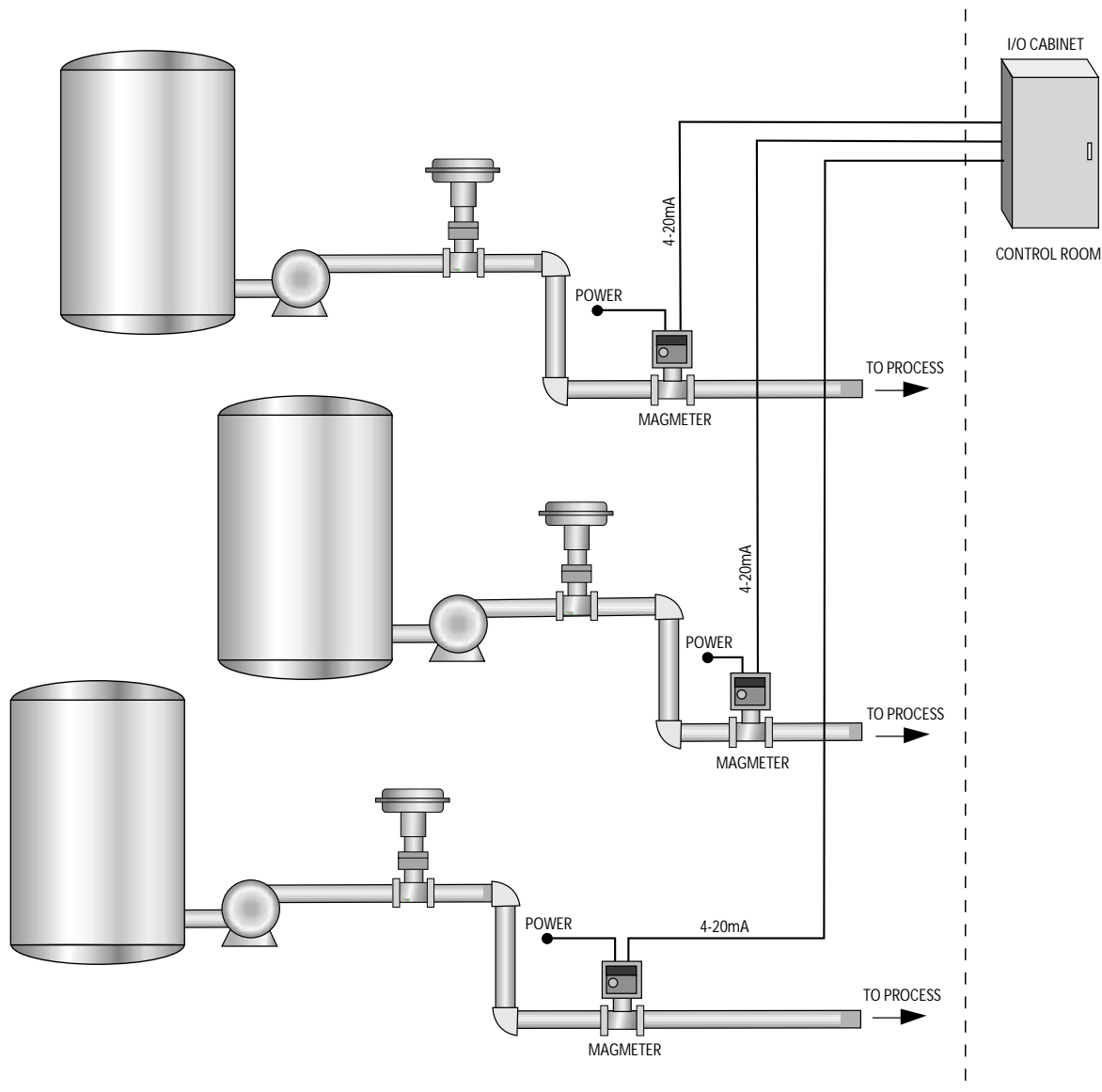
1 1/2" pipe dia	4 - 5
2" pipe dia.	6 - 7
3" pipe dia.	8 - 9
4" pipe dia.	10 - 11
6" pipe dia.	12 - 13
8" pipe dia.	14 - 15

Magmeter vs Ultrasonic

1 1/2" pipe dia.	16 - 17
2" pipe dia.	18 - 19
3" pipe dia.	20 - 21
4" pipe dia.	22 - 23
6" pipe dia.	24 - 25
8" pipe dia.	26 - 27

Magmeter Flow System

Flowmeters that are in contact with the process media carry the added burden of additional upfront installed costs. Welding, pipe cutting, flanges and gaskets are all factors that should be considered when evaluating the total cost of ownership.

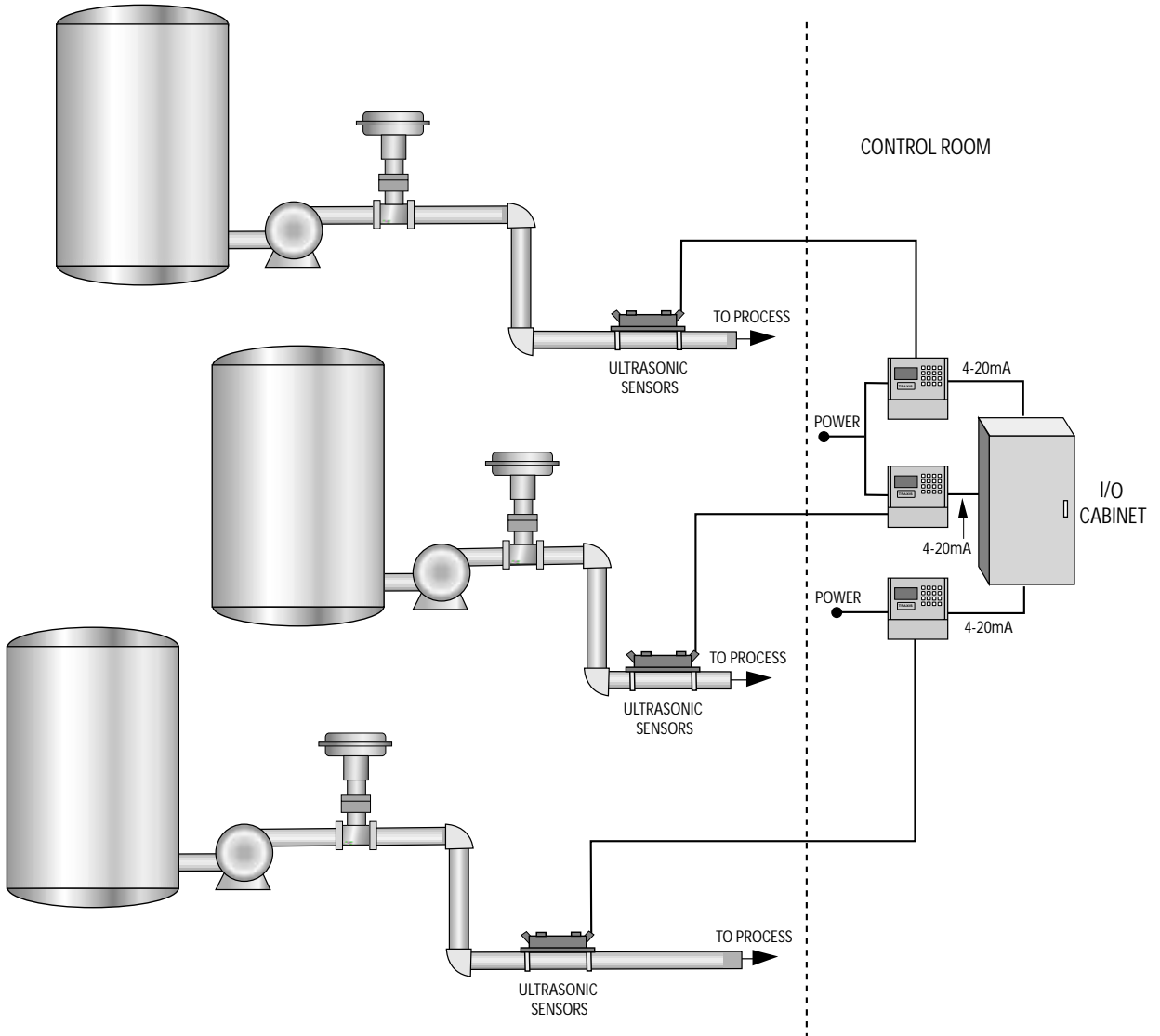


MAGMETER SYSTEM COST (16 Flowmeter System) 2" Pipe Diameter Nonincendive (Div. 2)	Labor Cost	\$1,449.40/meter x 16	\$23,190.40
	Material Cost	\$3,644.22/meter x 16	\$58,307.52
	TOTAL COST		\$81,497.92

See detailed cost analysis on page 18

Ultrasonic Flow System

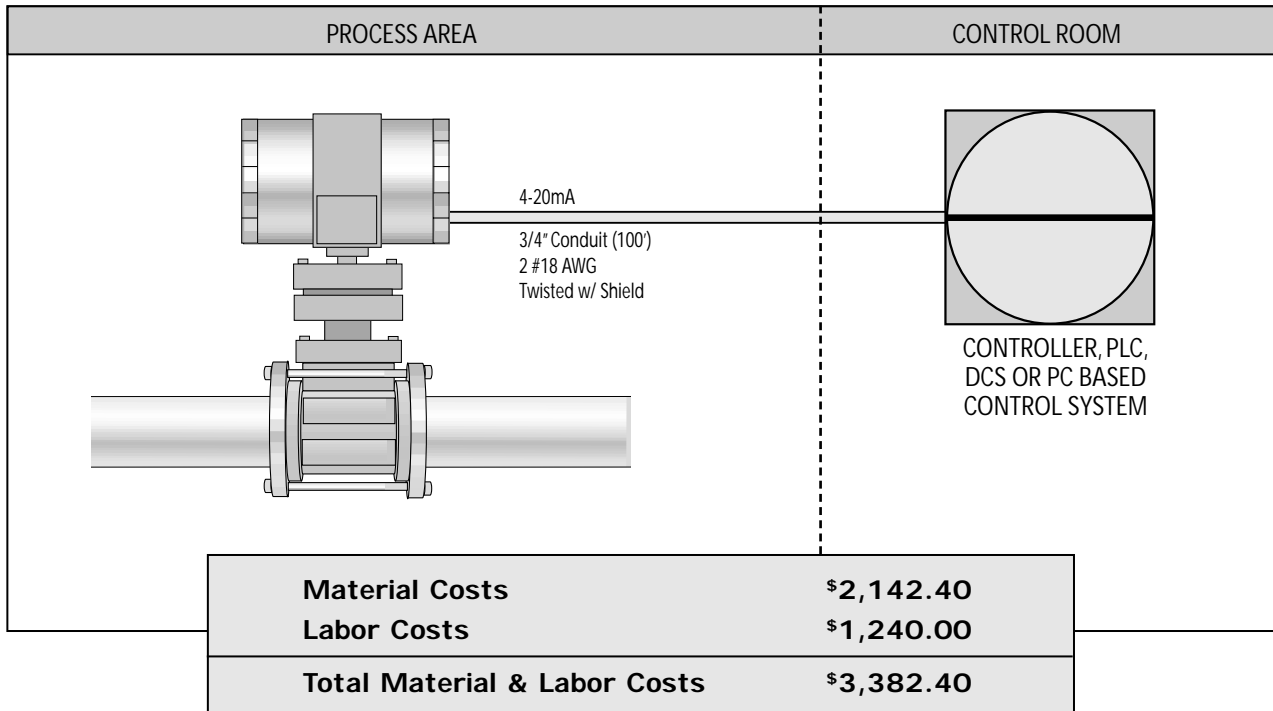
Transit-time flowmeters have created the capability for providing flow measurement systems that are less costly and consistently reliable. Besides the economic benefits of reduced material and labor costs, nonintrusive flowmeters eliminate the ongoing maintenance concerns of clogging, corrosion and the need for constant recalibration of the meter.



ULTRASONIC SYSTEM COST (16 Flowmeter System) 2" Pipe Diameter Nonincendive (Div. 2)	Labor Cost	\$427.60/meter x 16	\$6,841.60
	Material Cost	\$2,769.40/meter x 16	\$44,310.40
	TOTAL COST		\$51,152.00

See detailed cost analysis on page 19

Vortex



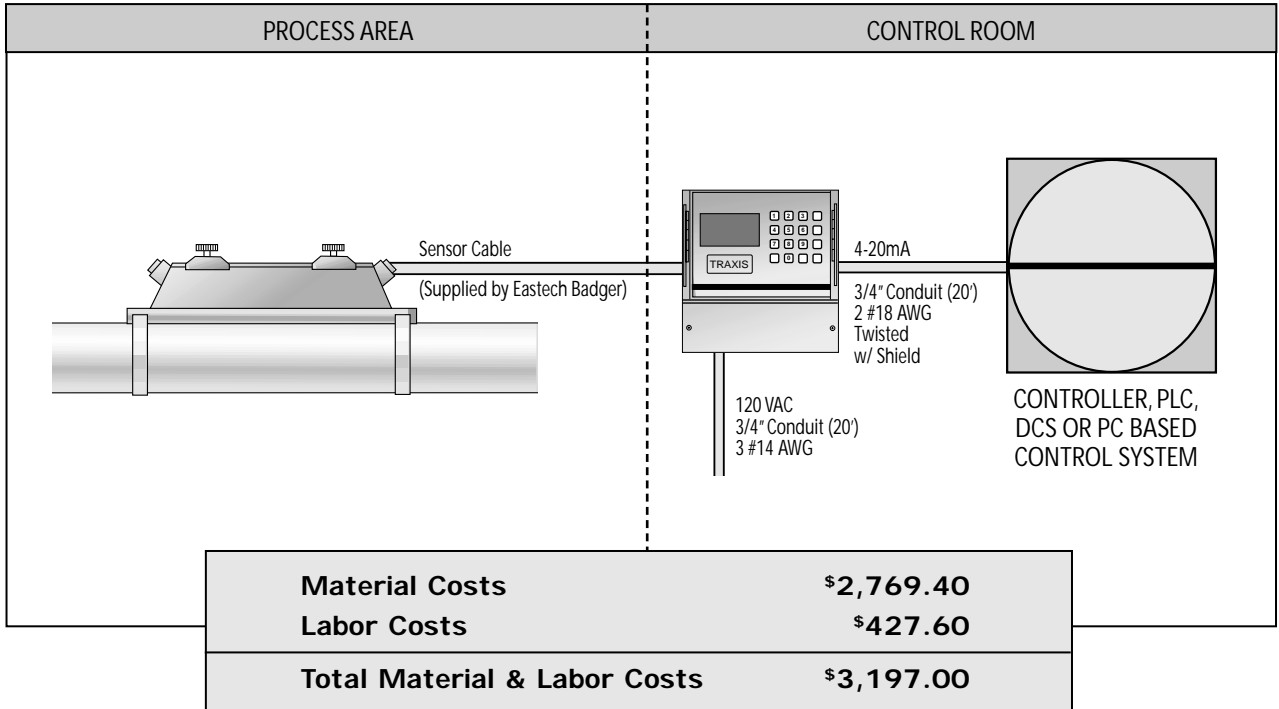
DETAILED COST ANALYSIS Class I Groups A, B, C, D, Class II, Groups F & G, Division 2

MATERIAL DESCRIPTION	TAKEOFF QUANTITY		INSTALLATION LABOR			MATERIAL		TOTAL L&M COST
	AMOUNT	UNIT	TOTAL HOURS	MH RATE ¹	LABOR COST	COST/UNIT	MATERIAL COST	
1 1/2" Vortex (wafer)	1	each	-	-	-	-	1742.40 ²	\$1742.40
Cut Pipe	-	-	2	50	100	-	-	\$100.00
150 RF 304 Flanges	2	each	-	-	-	16.40	32.80	\$32.80
Weld Flanges	-	-	2	50	100	-	-	\$100.00
Bolts, Nuts, Gaskets	-	lot	-	-	-	-	20.20	\$20.20
Install Vortex Meter	-	-	2	50	100	-	-	\$100.00
3/4" Conduit (power)	-	feet	-	-	-	-	-	-
#14 - 3 Conductor Wire	-	feet	-	-	-	-	-	-
3/4" Conduit (signal)	100	feet	-	6.35/LF	635	1.62	162.00	\$797.00
#18 - 2 conductor Cable	100	feet	-	3.05/LF	305	1.85	185.00	\$490.00
TOTALS			6		\$1240.00		\$2142.40	\$3382.40

¹ Labor rates are estimated at \$50/hr/man.

² Meter costs are based on Foxboro list prices.

Ultrasonic



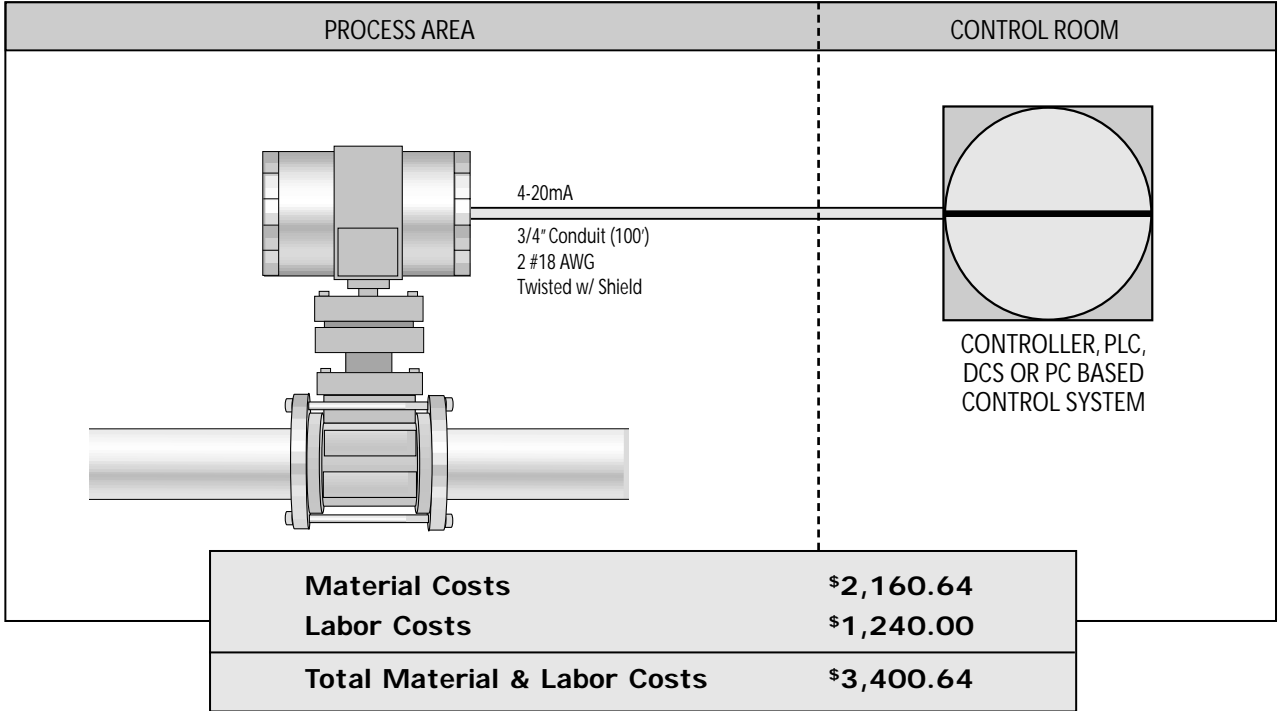
DETAILED COST ANALYSIS Class I Groups A, B, C, D, Class II, Groups F & G, Division 2

MATERIAL DESCRIPTION	TAKEOFF QUANTITY		INSTALLATION LABOR			MATERIAL		TOTAL L&M COST
	AMOUNT	UNIT	TOTAL HOURS	MH RATE ¹	LABOR COST	COST/UNIT	MATERIAL COST	
1 1/2" Ultrasonic Meter	1	each	-	-	-	-	2665.00 ²	\$2665.00
Cut Pipe	-	-	-	50	-	-	-	-
150 RF 304 Flanges		each	-	-	-	-	-	-
Weld Flanges	-	-	-	50	-	-	-	-
Bolts, Nuts, Gaskets	-	lot	-	-	-	-	-	-
Install Flowmeter	-	-	2	50	100	-	-	\$100.00
3/4" Conduit (power)	20	feet	-	6.35/LF	127	1.62	32.40	\$159.40
#14 - 3 Conductor Wire	20	feet	-	.63/LF	12.60	.13	2.60	\$15.20
3/4" Conduit (signal)	20	feet	-	6.35/LF	127	1.62	32.40	\$159.40
#18 - 2 conductor Cable	20	feet	-	3.05/LF	61	1.85	37.00	\$98.00
TOTALS			2		\$427.60		\$2769.40	\$3,197.00

¹ Labor rates are estimated at \$50/hr/man.

² Meter costs are based on Eastech Badger list prices.

Vortex



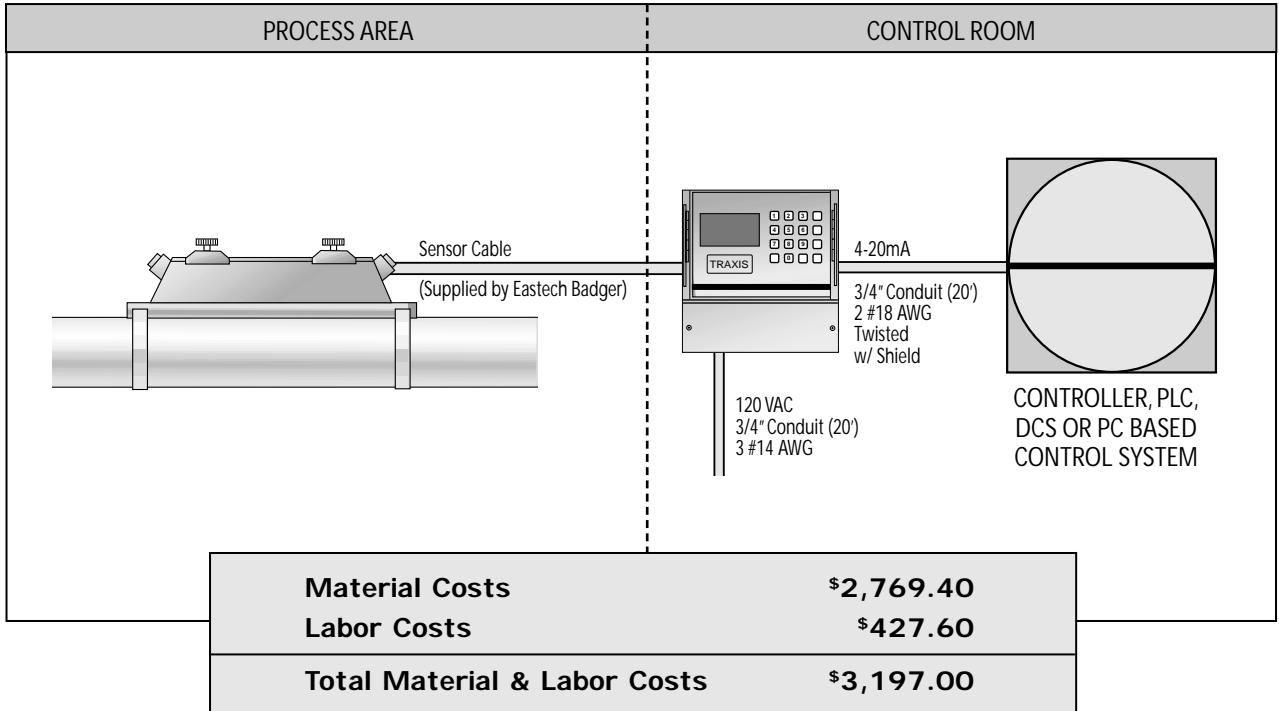
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MATERIAL DESCRIPTION	TAKEOFF QUANTITY		INSTALLATION LABOR			MATERIAL		TOTAL L&M COST
	AMOUNT	UNIT	TOTAL HOURS	MH RATE ¹	LABOR COST	COST/UNIT	MATERIAL COST	
2" Vortex (wafer)	1	each	-	-	-	-	1755.92 ²	\$1755.92
Cut Pipe	-	-	2	50	100	-	-	\$100.00
150 RF 304 Flanges	2	each	-	-	-	18.28	36.56	\$36.56
Weld Flanges	-	-	2	50	100	-	-	\$100.00
Bolts, Nuts, Gaskets	-	lot	-	-	-	-	21.16	\$21.16
Install Vortex Meter	-	-	2	50	100	-	-	\$100.00
3/4" Conduit (power)	-	feet	-	-	-	-	-	-
#14 - 3 Conductor Wire	-	feet	-	-	-	-	-	-
3/4" Conduit (signal)	100	feet	-	6.35/LF	635	1.62	162.00	\$797.00
#18 - 2 conductor Cable	100	feet	-	3.05/LF	305	1.85	185.00	\$490.00
TOTALS			6		\$1240.00		\$2160.64	\$3400.64

¹ Labor rates are estimated at \$50/hr/man.

² Meter costs are based on Foxboro list prices.

Ultrasonic



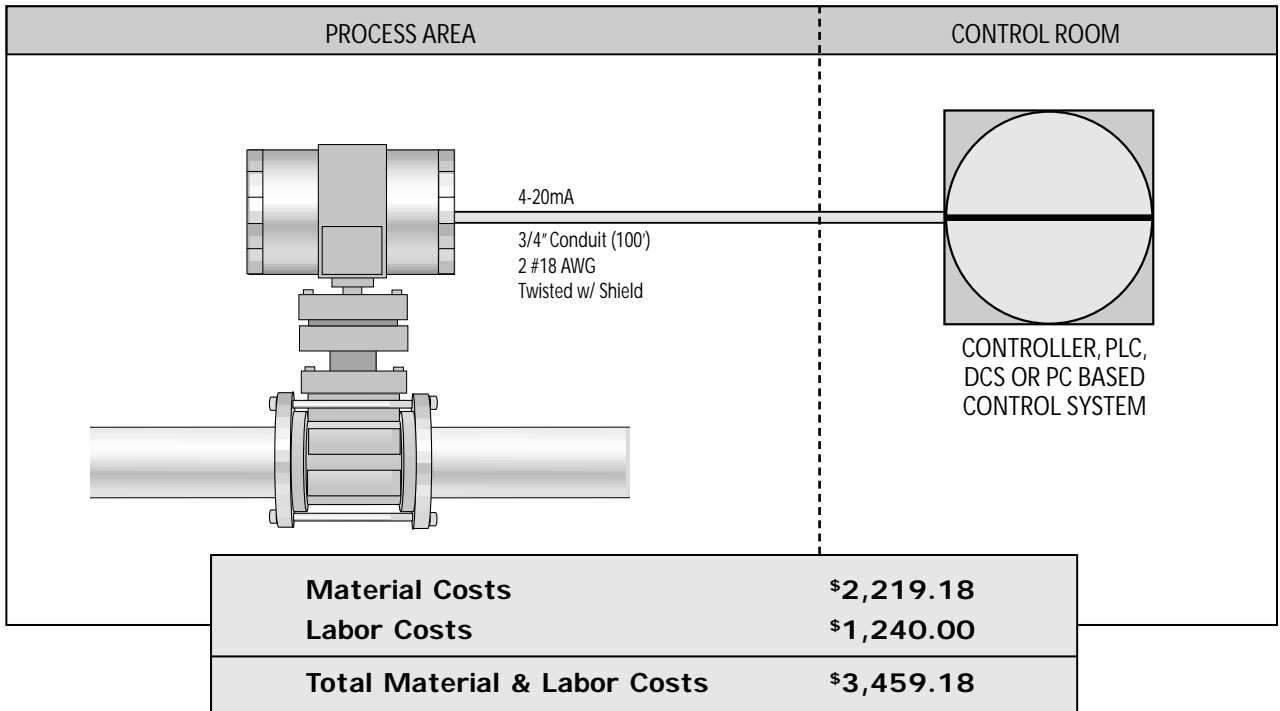
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MATERIAL DESCRIPTION	TAKEOFF QUANTITY		INSTALLATION LABOR			MATERIAL		TOTAL L&M COST
	AMOUNT	UNIT	TOTAL HOURS	MH RATE ¹	LABOR COST	COST/UNIT	MATERIAL COST	
2" Ultrasonic Meter	1	each	-	-	-	-	2665.00 ²	\$2665.00
Cut Pipe	-	-	-	50	-	-	-	-
150 RF 304 Flanges	-	each	-	-	-	-	-	-
Weld Flanges	-	-	-	50	-	-	-	-
Bolts, Nuts, Gaskets	-	lot	-	-	-	-	-	-
Install Flowmeter	-	-	2	50	100	-	-	\$100.00
3/4" Conduit (power)	20	feet	-	6.35/LF	127	1.62	32.40	\$159.40
#14 - 3 Conductor Wire	20	feet	-	.63/LF	12.60	.13	2.60	\$15.20
3/4" Conduit (signal)	20	feet	-	6.35/LF	127	1.62	32.40	\$159.40
#18 - 2 conductor Cable	20	feet	-	3.05/LF	61	1.85	37.00	\$98.00
TOTALS			2		\$427.60		\$2769.40	\$3,197.00

¹ Labor rates are estimated at \$50/hr/man.

² Meter costs are based on Eastech Badger list prices.

Vortex



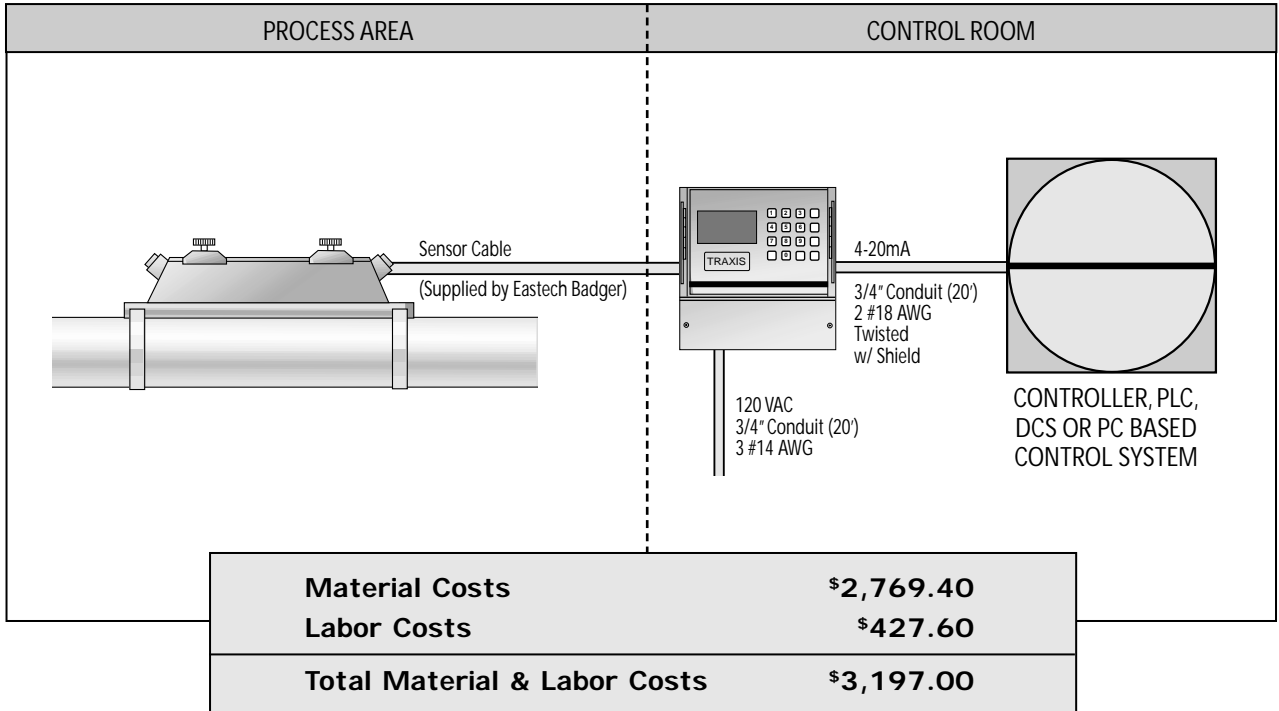
DETAILED COST ANALYSIS Class I Groups A, B, C, D, Class II, Groups F & G, Division 2

MATERIAL DESCRIPTION	TAKEOFF QUANTITY		INSTALLATION LABOR			MATERIAL		TOTAL L&M COST
	AMOUNT	UNIT	TOTAL HOURS	MH RATE ¹	LABOR COST	COST/UNIT	MATERIAL COST	
3" Vortex (wafer)	1	each	-	-	-	-	1793.36 ²	\$1793.36
Cut Pipe	-	-	2	50	100	-	-	\$100.00
150 RF 304 Flanges	2	each	-	-	-	26.37	52.75	\$52.74
Weld Flanges	-	-	2	50	100	-	-	\$100.00
Bolts, Nuts, Gaskets	-	lot	-	-	-	-	26.08	\$26.08
Install Vortex Meter	-	-	2	50	100	-	-	\$100.00
3/4" Conduit (power)	-	feet	-	-	-	-	-	-
#14 - 3 Conductor Wire	-	feet	-	-	-	-	-	-
3/4" Conduit (signal)	100	feet	-	6.35/LF	635	1.62	162.00	\$797.00
#18 - 2 conductor Cable	100	feet	-	3.05/LF	305	1.85	185.00	\$490.00
TOTALS			6		\$1240.00		\$2219.18	\$3459.18

¹ Labor rates are estimated at \$50/hr/man.

² Meter costs are based on Foxboro list prices.

Ultrasonic



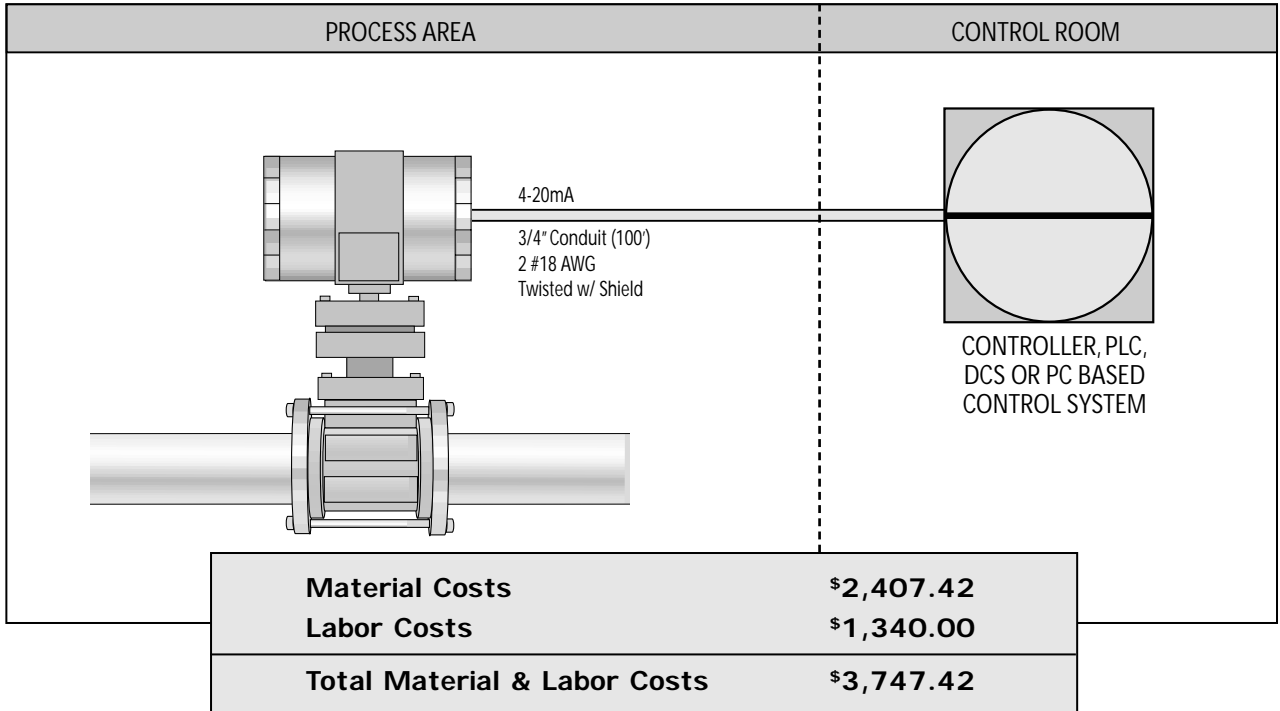
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MATERIAL DESCRIPTION	TAKEOFF QUANTITY		INSTALLATION LABOR			MATERIAL		TOTAL L&M COST
	AMOUNT	UNIT	TOTAL HOURS	MH RATE ¹	LABOR COST	COST/UNIT	MATERIAL COST	
3" Ultrasonic Meter	1	each	-	-	-	-	2665.00 ²	\$2665.00
Cut Pipe	-	-	-	50	-	-	-	-
150 RF 304 Flanges		each	-	-	-	-	-	-
Weld Flanges	-	-	-	50	-	-	-	-
Bolts, Nuts, Gaskets	-	lot	-	-	-	-	-	-
Install Flowmeter	-	-	2	50	100	-	-	\$100.00
3/4" Conduit (power)	20	feet	-	6.35/LF	127	1.62	32.40	\$159.40
#14 - 3 Conductor Wire	20	feet	-	.63/LF	12.60	.13	2.60	\$15.20
3/4" Conduit (signal)	20	feet	-	6.35/LF	127	1.62	32.40	\$159.40
#18 - 2 conductor Cable	20	feet	-	3.05/LF	61	1.85	37.00	\$98.00
TOTALS			2		\$427.60		\$2769.40	\$3,197.00

¹ Labor rates are estimated at \$50/hr/man.

² Meter costs are based on Eastech Badger list prices.

Vortex



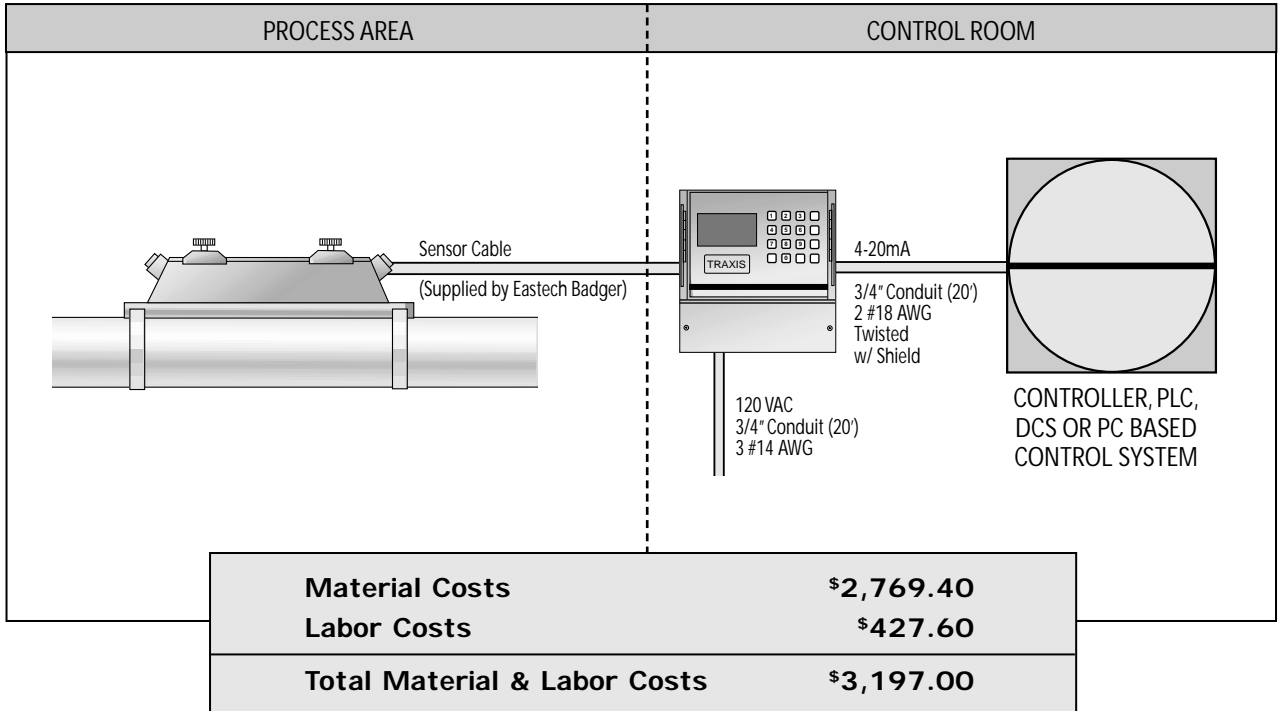
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MATERIAL DESCRIPTION	TAKEOFF QUANTITY		INSTALLATION LABOR			MATERIAL		TOTAL L&M COST
	AMOUNT	UNIT	TOTAL HOURS	MH RATE ¹	LABOR COST	COST/UNIT	MATERIAL COST	
4" Vortex (wafer)	1	each	-	-	-	-	1937.92 ²	\$1937.92
Cut Pipe	-	-	2	50	100	-	-	\$100.00
150 RF 304 Flanges	2	each	-	-	-	35.98	71.96	\$71.96
Weld Flanges	-	-	3	50	150	-	-	\$150.00
Bolts, Nuts, Gaskets	-	lot	-	-	-	-	50.54	\$50.54
Install Vortex Meter	-	-	3	50	150	-	-	\$150.00
3/4" Conduit (power)	-	feet	-	-	-	-	-	-
#14 - 3 Conductor Wire	-	feet	-	-	-	-	-	-
3/4" Conduit (signal)	100	feet	-	6.35/LF	635	1.62	162.00	\$797.00
#18 - 2 conductor Cable	100	feet	-	3.05/LF	305	1.85	185.00	\$490.00
TOTALS			8		\$1340.00		\$2407.42	\$3747.42

¹ Labor rates are estimated at \$50/hr/man.

² Meter costs are based on Foxboro list prices.

Ultrasonic



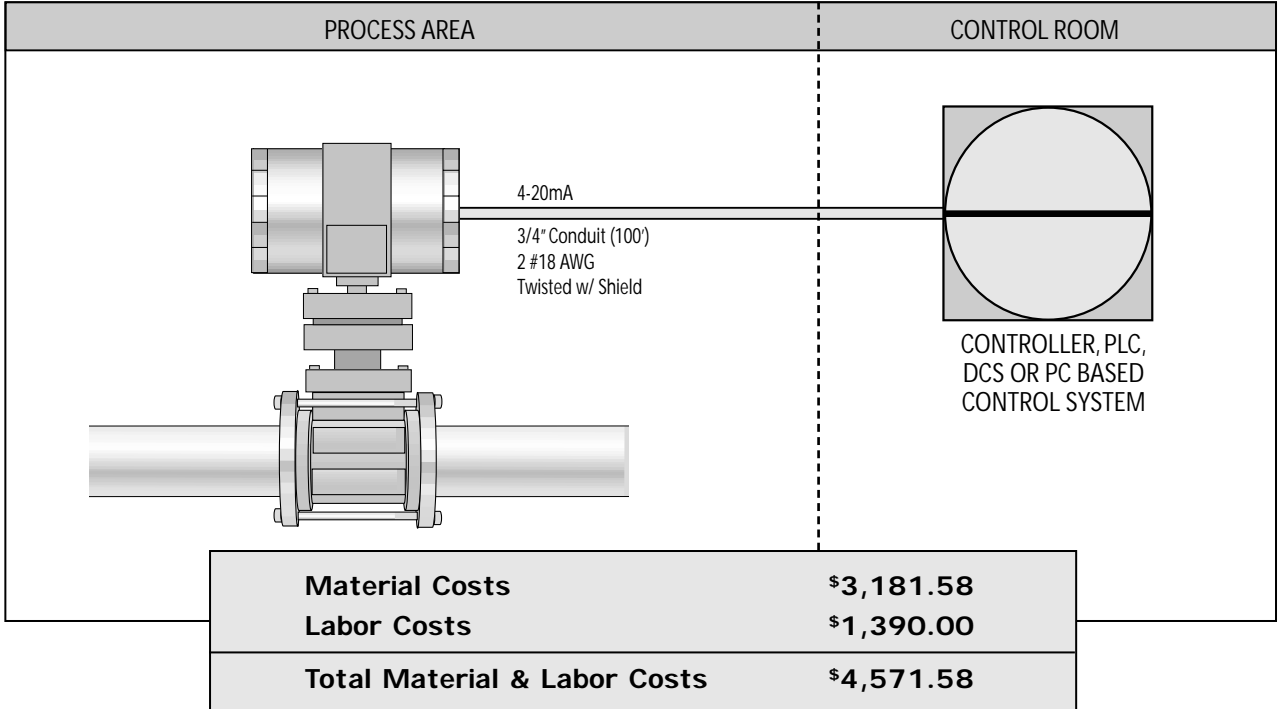
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MATERIAL DESCRIPTION	TAKEOFF QUANTITY		INSTALLATION LABOR			MATERIAL		TOTAL L&M COST
	AMOUNT	UNIT	TOTAL HOURS	MH RATE ¹	LABOR COST	COST/UNIT	MATERIAL COST	
4" Ultrasonic Meter	1	each	-	-	-	-	2665.00 ²	\$2665.00
Cut Pipe	-	-	-	50	-	-	-	-
150 RF 304 Flanges		each	-	-	-	-	-	-
Weld Flanges	-	-	-	50	-	-	-	-
Bolts, Nuts, Gaskets	-	lot	-	-	-	-	-	-
Install Flowmeter	-	-	2	50	100	-	-	\$100.00
3/4" Conduit (power)	20	feet	-	6.35/LF	127	1.62	32.40	\$159.40
#14 - 3 Conductor Wire	20	feet	-	.63/LF	12.60	.13	2.60	\$15.20
3/4" Conduit (signal)	20	feet	-	6.35/LF	127	1.62	32.40	\$159.40
#18 - 2 conductor Cable	20	feet	-	3.05/LF	61	1.85	37.00	\$98.00
TOTALS			2		\$427.60		\$2769.40	\$3,197.00

¹ Labor rates are estimated at \$50/hr/man.

² Meter costs are based on Eastech Badger list prices.

Vortex



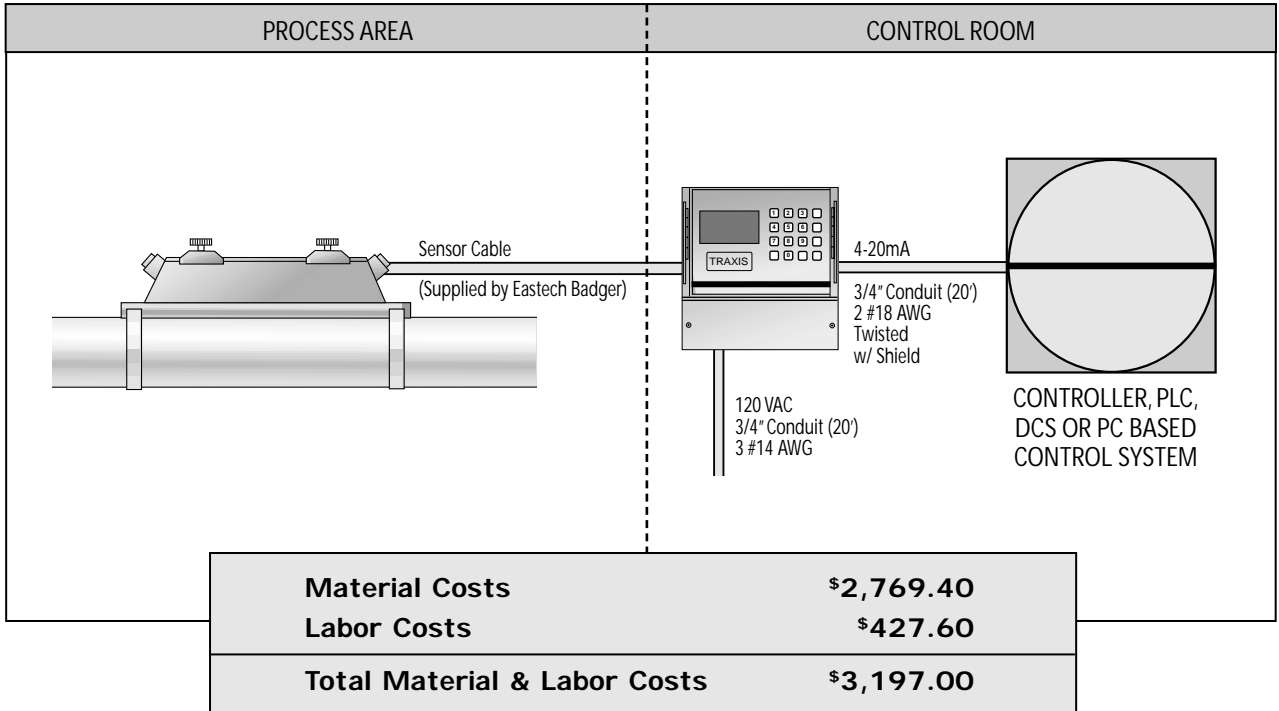
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MATERIAL DESCRIPTION	TAKEOFF QUANTITY		INSTALLATION LABOR			MATERIAL		TOTAL L&M COST
	AMOUNT	UNIT	TOTAL HOURS	MH RATE ¹	LABOR COST	COST/UNIT	MATERIAL COST	
6" Vortex (wafer)	1	each	-	-	-	-	2663.84 ²	\$2663.84
Cut Pipe	-	-	2	50	100	-	-	\$100.00
150 RF 304 Flanges	2	each	-	-	-	56.90	113.80	\$113.80
Weld Flanges	-	-	3	50	150	-	-	\$150.00
Bolts, Nuts, Gaskets	-	lot	-	-	-	-	56.94	\$56.94
Install Vortex Meter	-	-	4	50	200	-	-	\$200.00
3/4" Conduit (power)	-	feet	-	-	-	-	-	-
#14 - 3 Conductor Wire	-	feet	-	-	-	-	-	-
3/4" Conduit (signal)	100	feet	-	6.35/LF	635	1.62	162.00	\$797.00
#18 - 2 conductor Cable	100	feet	-	3.05/LF	305	1.85	185.00	\$490.00
TOTALS			9		\$1390.00		\$3181.58	\$4571.58

¹ Labor rates are estimated at \$50/hr/man.

² Meter costs are based on Foxboro list prices.

Ultrasonic



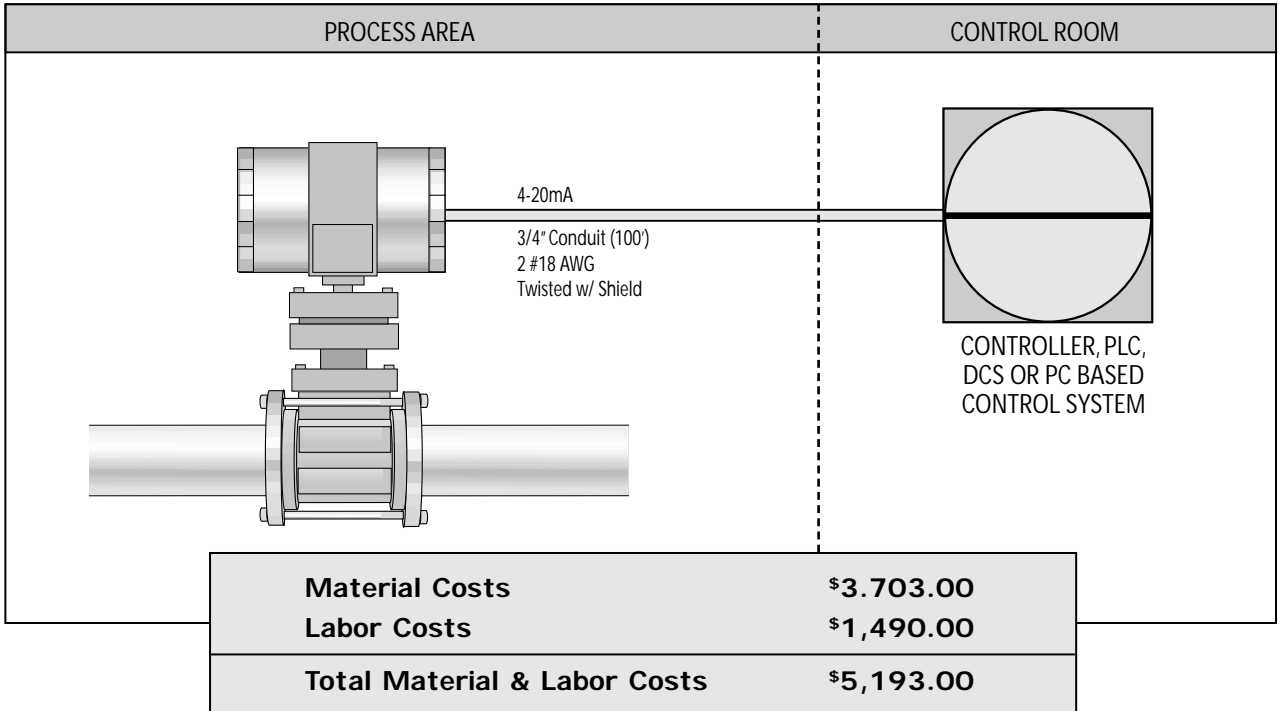
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MATERIAL DESCRIPTION	TAKEOFF QUANTITY		INSTALLATION LABOR			MATERIAL		TOTAL L&M COST
	AMOUNT	UNIT	TOTAL HOURS	MH RATE ¹	LABOR COST	COST/UNIT	MATERIAL COST	
6" Ultrasonic Meter	1	each	-	-	-	-	2665.00 ²	\$2665.00
Cut Pipe	-	-	-	50	-	-	-	-
150 RF 304 Flanges		each	-	-	-	-	-	-
Weld Flanges	-	-	-	50	-	-	-	-
Bolts, Nuts, Gaskets	-	lot	-	-	-	-	-	-
Install Flowmeter	-	-	2	50	100	-	-	\$100.00
3/4" Conduit (power)	20	feet	-	6.35/LF	127	1.62	32.40	\$159.40
#14 - 3 Conductor Wire	20	feet	-	.63/LF	12.60	.13	2.60	\$15.20
3/4" Conduit (signal)	20	feet	-	6.35/LF	127	1.62	32.40	\$159.40
#18 - 2 conductor Cable	20	feet	-	3.05/LF	61	1.85	37.00	\$98.00
TOTALS			2		\$427.60		\$2769.40	\$3,197.00

¹ Labor rates are estimated at \$50/hr/man.

² Meter costs are based on Eastech Badger list prices.

Vortex



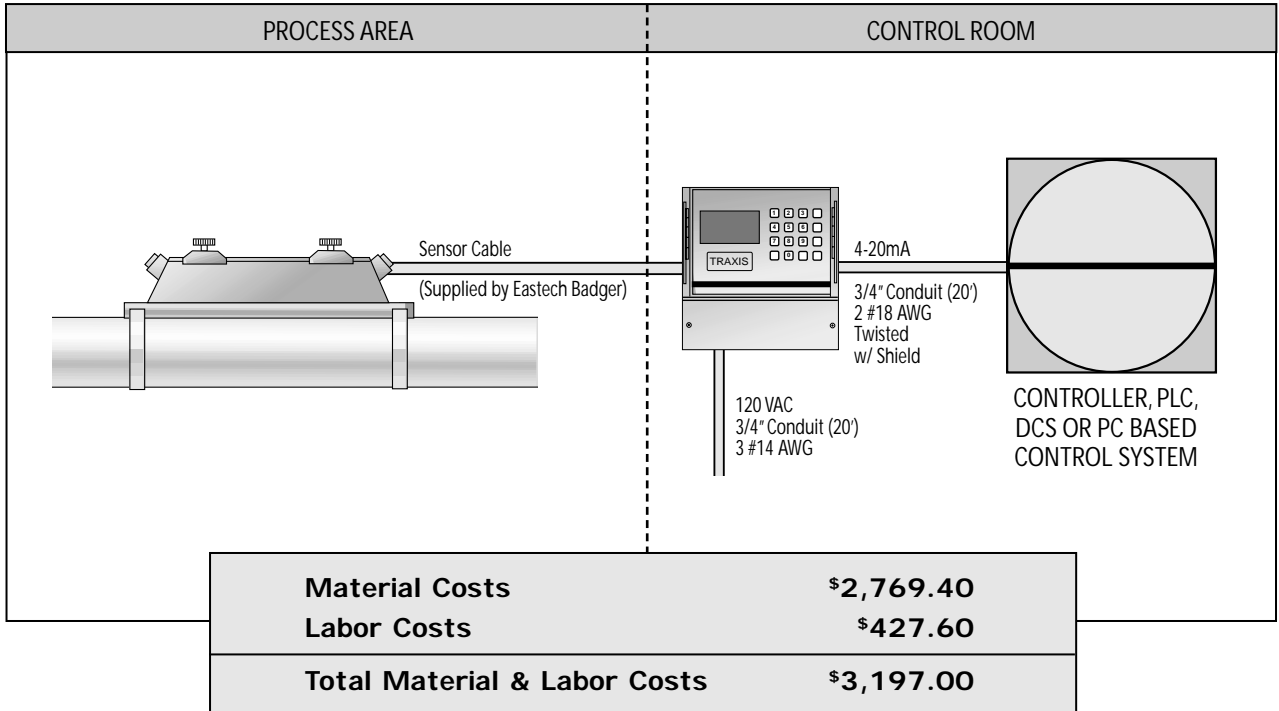
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MATERIAL DESCRIPTION	TAKEOFF QUANTITY		INSTALLATION LABOR			MATERIAL		TOTAL L&M COST
	AMOUNT	UNIT	TOTAL HOURS	MH RATE ¹	LABOR COST	COST/UNIT	MATERIAL COST	
8" Vortex (wafer)	1	each	-	-	-	-	3079.84 ²	\$3079.84
Cut Pipe	-	-	3	50	150	-	-	\$150.00
150 RF 304 Flanges	2	each	-	-	-	108.34	216.68	\$216.88
Weld Flanges	-	-	4	50	200	-	-	\$200.00
Bolts, Nuts, Gaskets	-	lot	-	-	-	-	59.48	\$59.48
Install Vortex Meter	-	-	4	50	200	-	-	\$200.00
3/4" Conduit (power)	-	feet	-	-	-	-	-	-
#14 - 3 Conductor Wire	-	feet	-	-	-	-	-	-
3/4" Conduit (signal)	100	feet	-	6.35/LF	635	1.62	162.00	\$797.00
#18 - 2 conductor Cable	100	feet	-	3.05/LF	305	1.85	185.00	\$490.00
TOTALS			11		\$1490.00		\$3703.00	\$5193.00

¹ Labor rates are estimated at \$50/hr/man.

² Meter costs are based on Foxboro list prices.

Ultrasonic



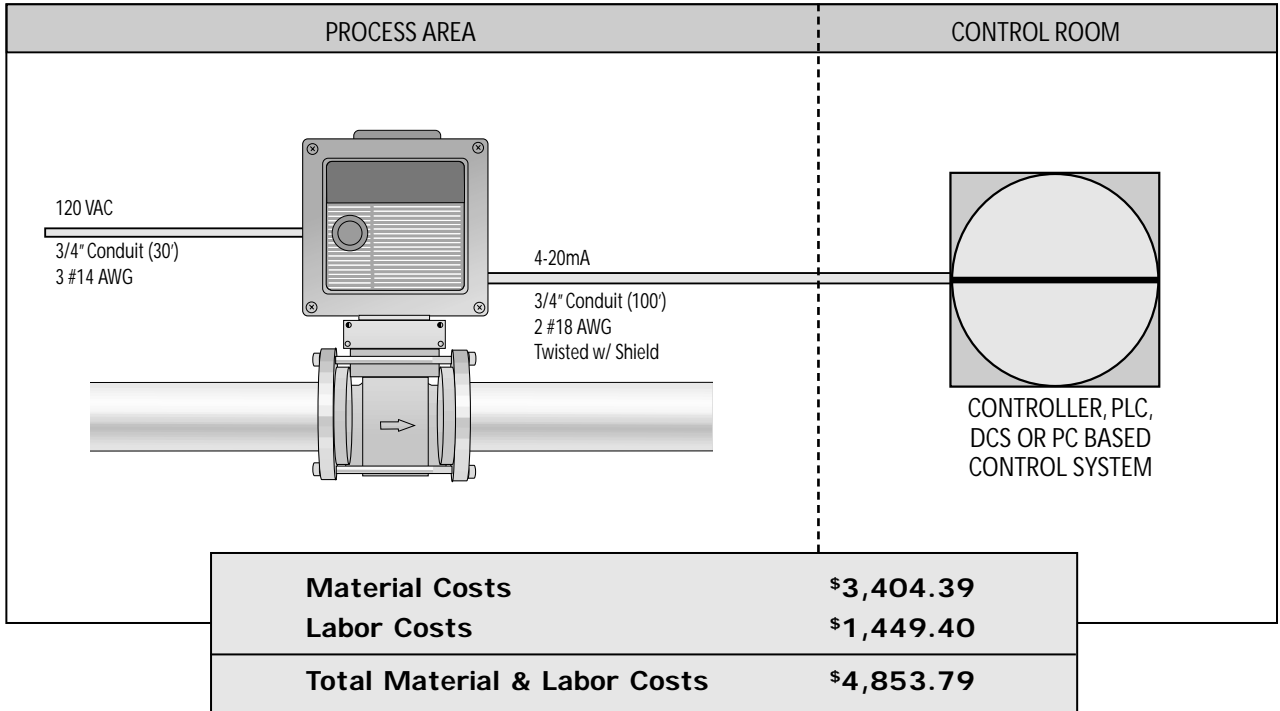
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MATERIAL DESCRIPTION	TAKEOFF QUANTITY		INSTALLATION LABOR			MATERIAL		TOTAL L&M COST
	AMOUNT	UNIT	TOTAL HOURS	MH RATE ¹	LABOR COST	COST/UNIT	MATERIAL COST	
8" Ultrasonic Meter	1	each	-	-	-	-	2665.00 ²	\$2665.00
Cut Pipe	-	-	-	50	-	-	-	-
150 RF 304 Flanges		each	-	-	-	-	-	-
Weld Flanges	-	-	-	50	-	-	-	-
Bolts, Nuts, Gaskets	-	lot	-	-	-	-	-	-
Install Flowmeter	-	-	2	50	100	-	-	\$100.00
3/4" Conduit (power)	20	feet	-	6.35/LF	127	1.62	32.40	\$159.40
#14 - 3 Conductor Wire	20	feet	-	.63/LF	12.60	.13	2.60	\$15.20
3/4" Conduit (signal)	20	feet	-	6.35/LF	127	1.62	32.40	\$159.40
#18 - 2 conductor Cable	20	feet	-	3.05/LF	61	1.85	37.00	\$98.00
TOTALS			2		\$427.60		\$2769.40	\$3,197.00

¹ Labor rates are estimated at \$50/hr/man.

² Meter costs are based on Eastech Badger list prices.

Magmeter



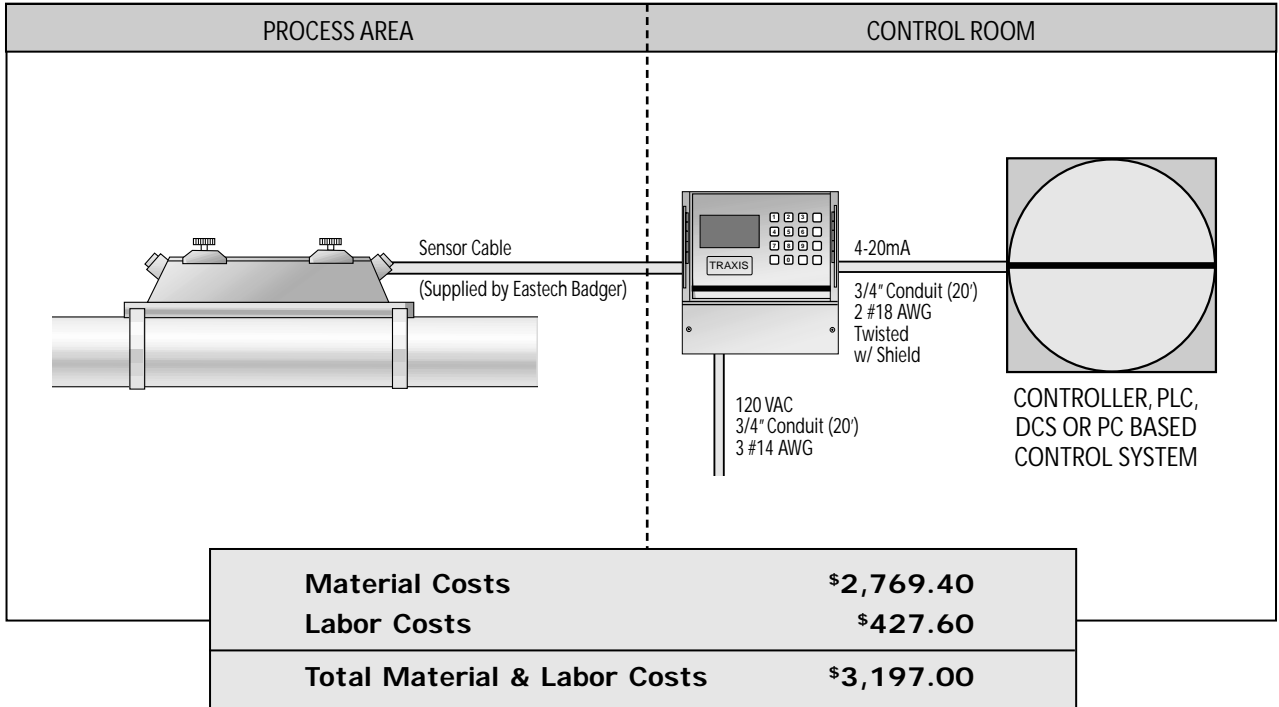
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MATERIAL DESCRIPTION	TAKEOFF QUANTITY		INSTALLATION LABOR			MATERIAL		TOTAL L&M COST
	AMOUNT	UNIT	TOTAL HOURS	MH RATE ¹	LABOR COST	COST/UNIT	MATERIAL COST	
1 1/2" Magmeter (wafer)	1	each	-	-	-	-	2951.89 ²	\$2951.89
Cut Pipe	-	-	2	50	100	-	-	\$100.00
150 RF 304 Flanges	2	each	-	-	-	16.40	32.80	\$32.80
Weld Flanges	-	-	2	50	100	-	-	\$100.00
Bolts, Nuts, Gaskets	-	lot	-	-	-	-	20.20	\$20.20
Install Magmeter	-	-	2	50	100	-	-	\$100.00
3/4" Conduit (power)	30	feet	-	6.35/LF	190.50	1.62	48.60	239.10
#14 - 3 Conductor Wire	30	feet	-	.63/LF	18.90	.13	3.90	22.80
3/4" Conduit (signal)	100	feet	-	6.35/LF	635	1.62	162.00	\$797.00
#18 - 2 conductor Cable	100	feet	-	3.05/LF	305	1.85	185.00	\$490.00
TOTALS			6		\$1449.40		\$3404.39	\$4853.79

¹ Labor rates are estimated at \$50/hr/man.

² Meter costs are based on Foxboro list prices.

Ultrasonic

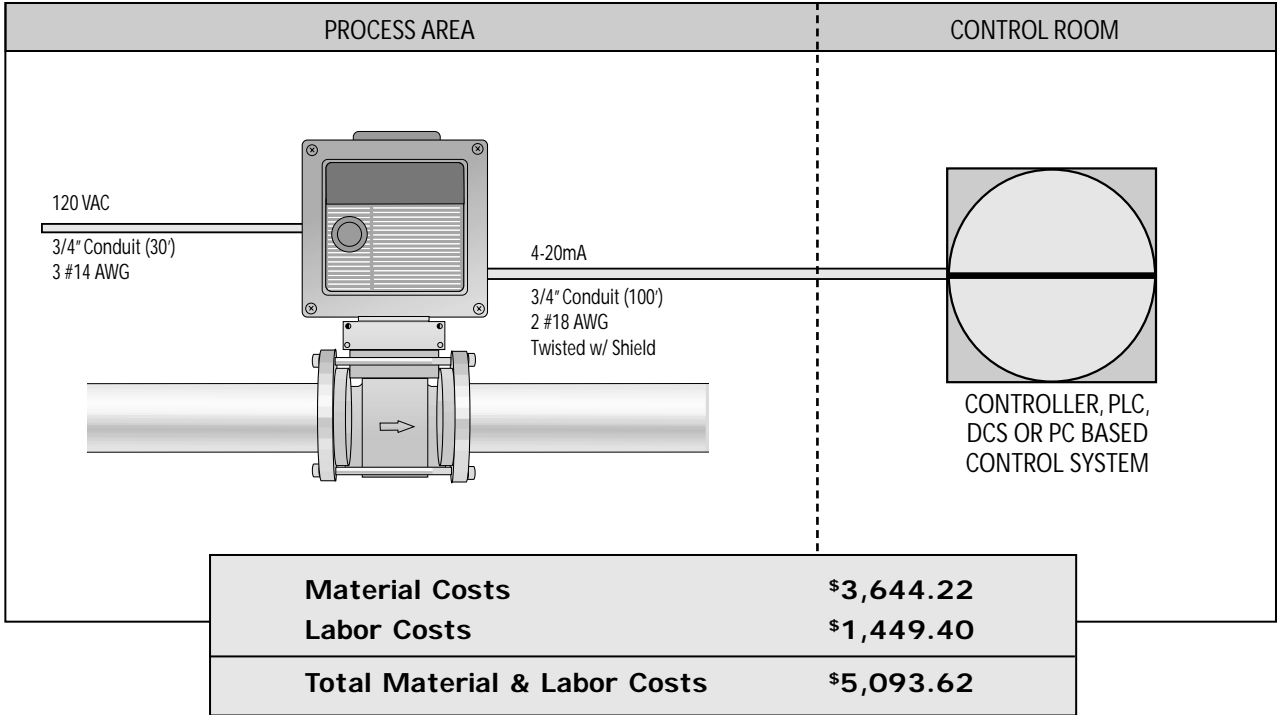


DETAILED COST ANALYSIS Class I Groups A, B, C, D, Class II, Groups F & G, Division 2

MATERIAL DESCRIPTION	TAKEOFF QUANTITY		INSTALLATION LABOR			MATERIAL		TOTAL L&M COST
	AMOUNT	UNIT	TOTAL HOURS	MH RATE ¹	LABOR COST	COST/UNIT	MATERIAL COST	
1 1/2" Ultrasonic Meter	1	each	-	-	-	-	2665.00 ²	\$2665.00
Cut Pipe	-	-	-	50	-	-	-	-
150 RF 304 Flanges		each	-	-	-	-	-	-
Weld Flanges	-	-	-	50	-	-	-	-
Bolts, Nuts, Gaskets	-	lot	-	-	-	-	-	-
Install Flowmeter	-	-	2	50	100	-	-	\$100.00
3/4" Conduit (power)	20	feet	-	6.35/LF	127	1.62	32.40	\$159.40
#14 - 3 Conductor Wire	20	feet	-	.63/LF	12.60	.13	2.60	\$15.20
3/4" Conduit (signal)	20	feet	-	6.35/LF	127	1.62	32.40	\$159.40
#18 - 2 conductor Cable	20	feet	-	3.05/LF	61	1.85	37.00	\$98.00
TOTALS			2		\$427.60		\$2769.40	\$3,197.00

¹ Labor rates are estimated at \$50/hr/man.
² Meter costs are based on Eastech Badger list prices.

Magmeter



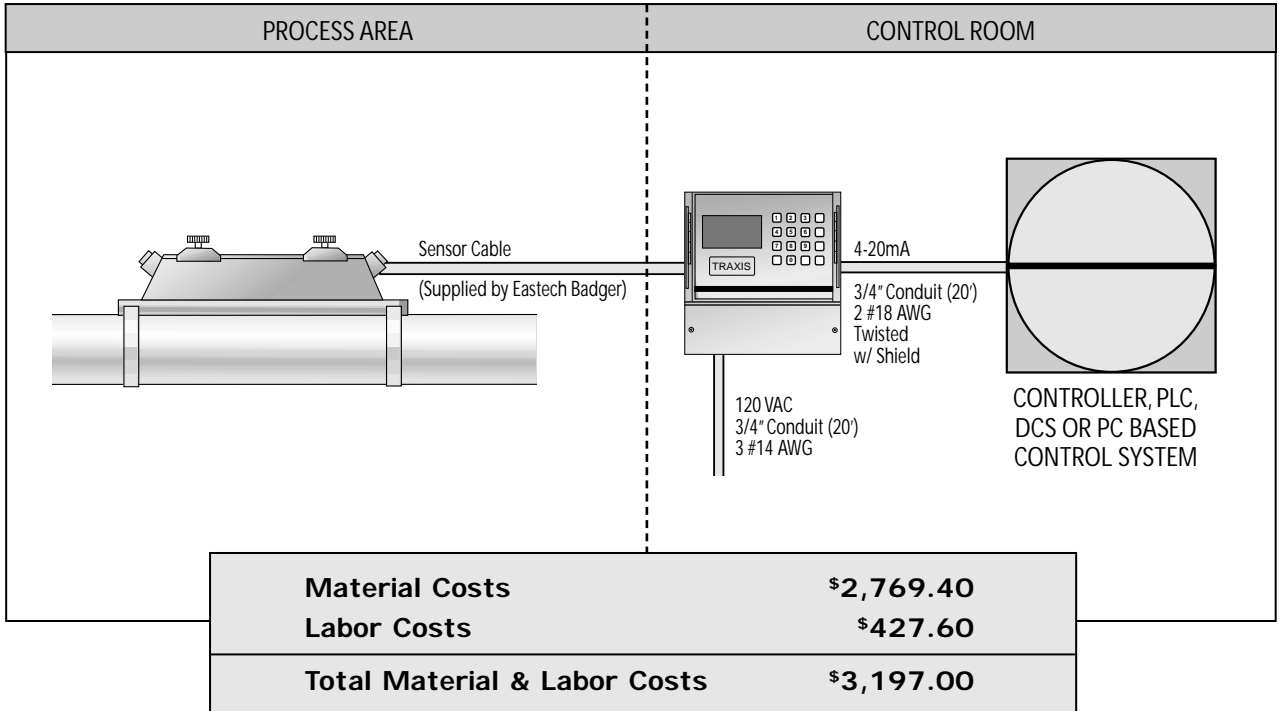
DETAILED COST ANALYSIS Class I Groups A, B, C, D, Class II, Groups F & G, Division 2

MATERIAL DESCRIPTION	TAKEOFF QUANTITY		INSTALLATION LABOR			MATERIAL		TOTAL L&M COST
	AMOUNT	UNIT	TOTAL HOURS	MH RATE ¹	LABOR COST	COST/UNIT	MATERIAL COST	
2" Magmeter (wafer)	1	each	-	-	-	-	3187.00 ²	\$3187.00
Cut Pipe	-	-	2	50	100	-	-	\$100.00
150 RF 304 Flanges	2	each	-	-	-	18.28	36.56	\$36.58
Weld Flanges	-	-	2	50	100	-	-	\$100.00
Bolts, Nuts, Gaskets	-	lot	-	-	-	-	21.16	\$21.16
Install Magmeter	-	-	2	50	100	-	-	\$100.00
3/4" Conduit (power)	30	feet	-	6.35/LF	190.50	1.62	48.60	239.10
#14 - 3 Conductor Wire	30	feet	-	.63/LF	18.90	.13	3.90	22.80
3/4" Conduit (signal)	100	feet	-	6.35/LF	635	1.62	162.00	\$797.00
#18 - 2 conductor Cable	100	feet	-	3.05/LF	305	1.85	185.00	\$490.00
TOTALS			6		\$1449.40		\$3644.22	\$5093.62

¹ Labor rates are estimated at \$50/hr/man.

² Meter costs are based on Foxboro list prices.

Ultrasonic



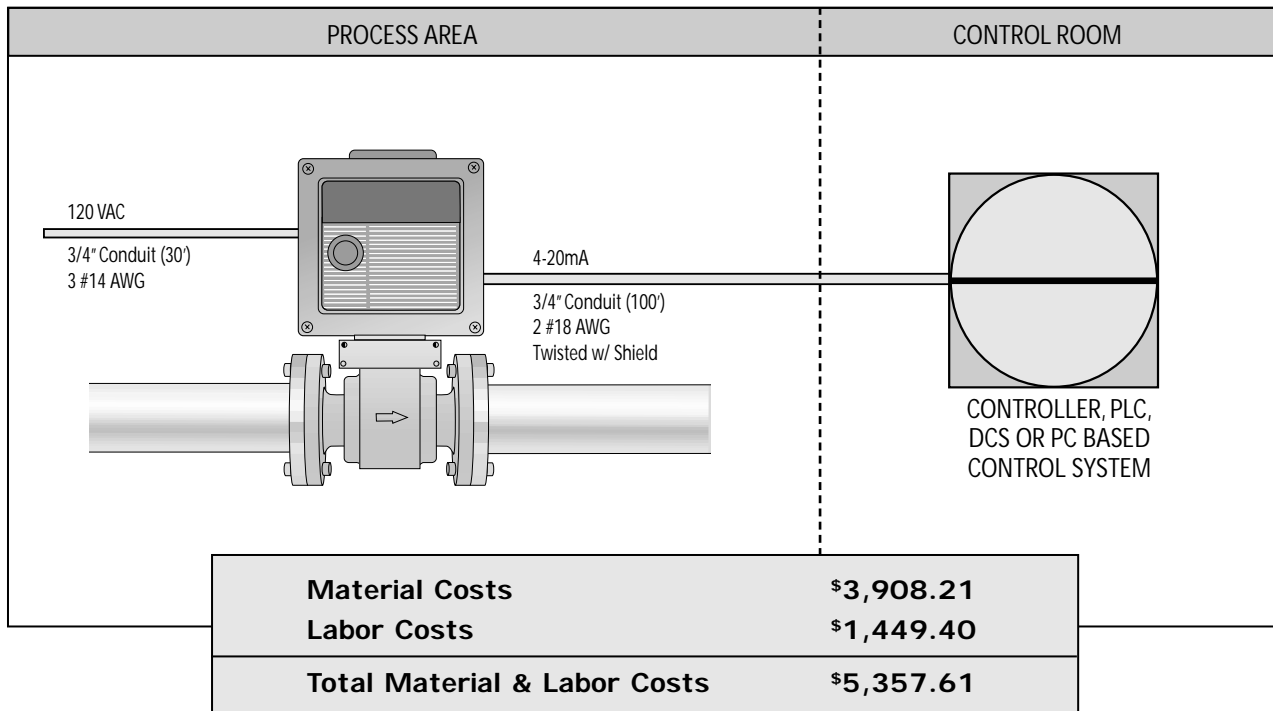
DETAILED COST ANALYSIS Class I Groups A, B, C, D, Class II, Groups F & G, Division 2

MATERIAL DESCRIPTION	TAKEOFF QUANTITY		INSTALLATION LABOR			MATERIAL		TOTAL L&M COST
	AMOUNT	UNIT	TOTAL HOURS	MH RATE ¹	LABOR COST	COST/UNIT	MATERIAL COST	
2" Ultrasonic Meter	1	each	-	-	-	-	2665.00 ²	\$2665.00
Cut Pipe	-	-	-	50	-	-	-	-
150 RF 304 Flanges		each	-	-	-	-	-	-
Weld Flanges	-	-	-	50	-	-	-	-
Bolts, Nuts, Gaskets	-	lot	-	-	-	-	-	-
Install Flowmeter	-	-	2	50	100	-	-	\$100.00
3/4" Conduit (power)	20	feet	-	6.35/LF	127	1.62	32.40	\$159.40
#14 - 3 Conductor Wire	20	feet	-	.63/LF	12.60	.13	2.60	\$15.20
3/4" Conduit (signal)	20	feet	-	6.35/LF	127	1.62	32.40	\$159.40
#18 - 2 conductor Cable	20	feet	-	3.05/LF	61	1.85	37.00	\$98.00
TOTALS			2		\$427.60		\$2769.40	\$3,197.00

¹ Labor rates are estimated at \$50/hr/man.

² Meter costs are based on Eastech Badger list prices.

Magmeter



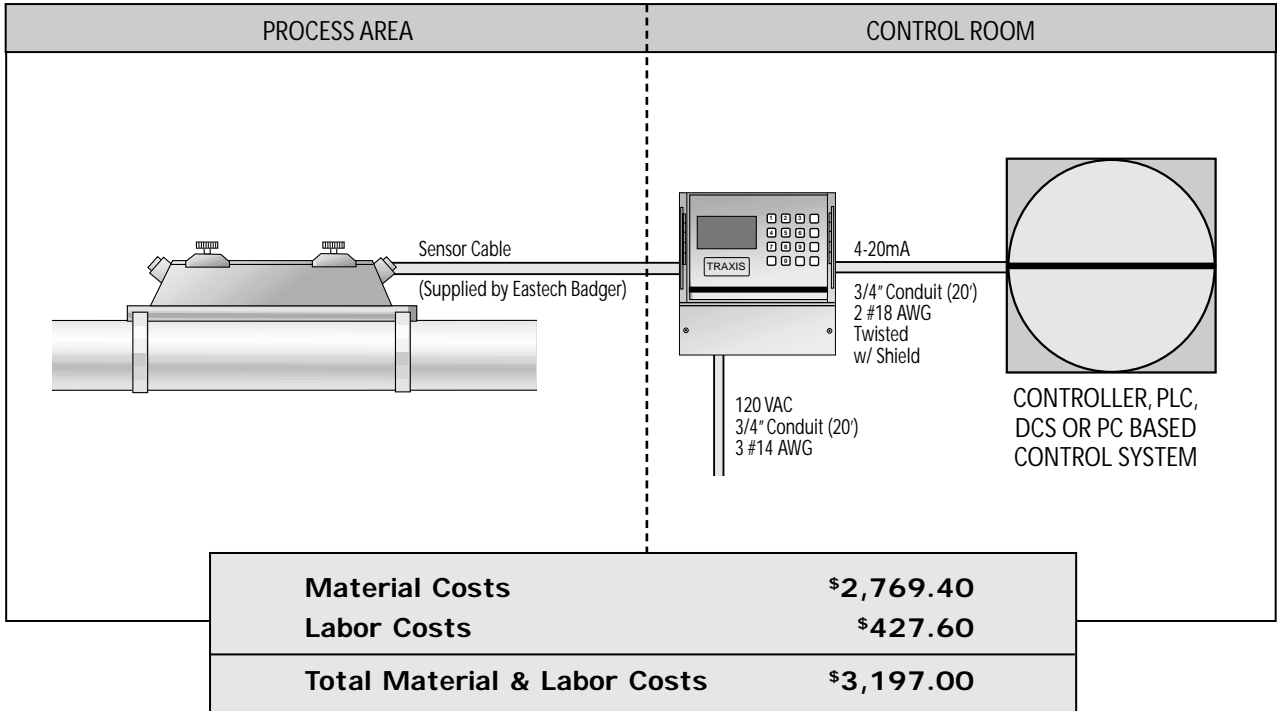
DETAILED COST ANALYSIS Class I Groups A, B, C, D, Class II, Groups F & G, Division 2

MATERIAL DESCRIPTION	TAKEOFF QUANTITY		INSTALLATION LABOR			MATERIAL		TOTAL L&M COST
	AMOUNT	UNIT	TOTAL HOURS	MH RATE ¹	LABOR COST	COST/UNIT	MATERIAL COST	
3" Magmeter (flanged)	1	each	-	-	-	-	3430.29 ²	\$3430.29
Cut Pipe	-	-	2	50	100	-	-	\$100.00
150 RF 304 Flanges	2	each	-	-	-	26.37	52.74	\$52.44
Weld Flanges	-	-	2	50	100	-	-	\$100.00
Bolts, Nuts, Gaskets	-	lot	-	-	-	-	25.68	\$25.68
Install Magmeter	-	-	2	50	100	-	-	\$100.00
3/4" Conduit (power)	30	feet	-	6.35/LF	190.50	.13	48.60	239.10
#14 - 3 Conductor Wire	30	feet	-	.63/LF	18.90	1.62	3.90	22.80
3/4" Conduit (signal)	100	feet	-	6.35/LF	635	1.62	162.00	\$797.00
#18 - 2 conductor Cable	100	feet	-	3.05/LF	305	1.85	185.00	\$490.00
TOTALS			6		\$1449.40		\$3908.21	\$5357.61

¹ Labor rates are estimated at \$50/hr/man.

² Meter costs are based on Foxboro list prices.

Ultrasonic



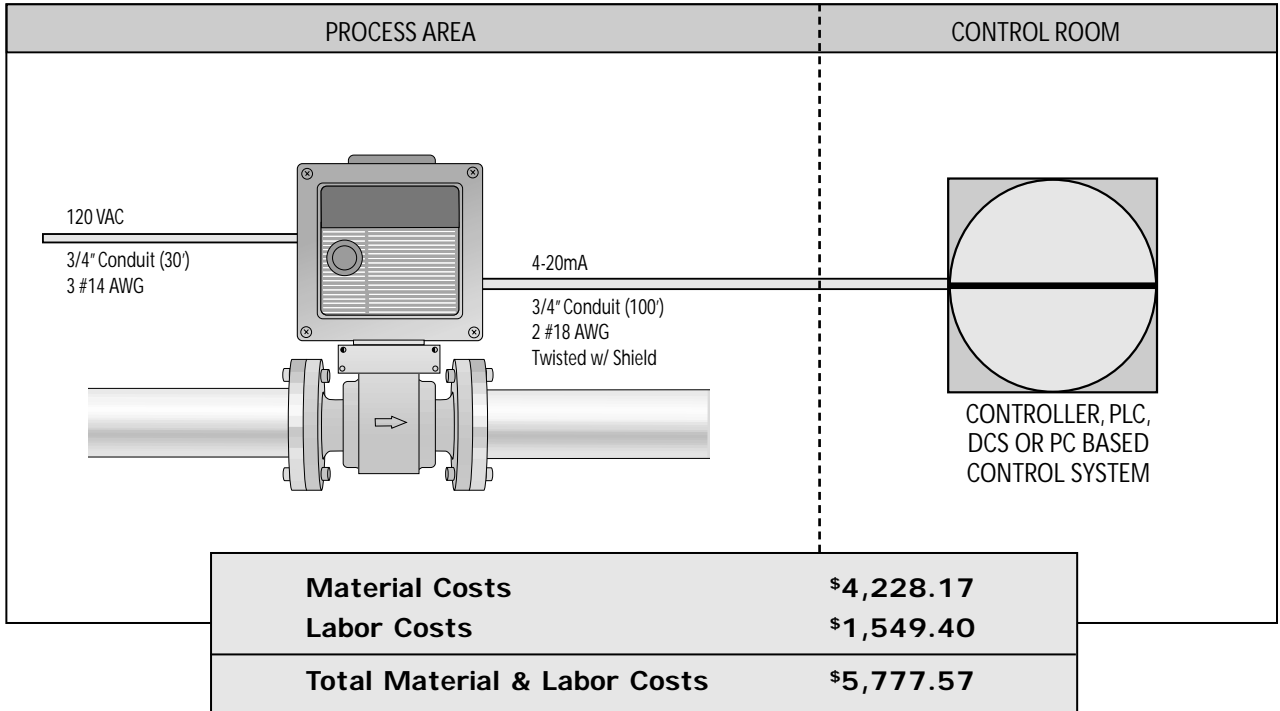
DETAILED COST ANALYSIS Class I Groups A, B, C, D, Class II, Groups F & G, Division 2

MATERIAL DESCRIPTION	TAKEOFF QUANTITY		INSTALLATION LABOR			MATERIAL		TOTAL L&M COST
	AMOUNT	UNIT	TOTAL HOURS	MH RATE ¹	LABOR COST	COST/UNIT	MATERIAL COST	
3" Ultrasonic Meter	1	each	-	-	-	-	2665.00 ²	\$2665.00
Cut Pipe	-	-	-	50	-	-	-	-
150 RF 304 Flanges		each	-	-	-	-	-	-
Weld Flanges	-	-	-	50	-	-	-	-
Bolts, Nuts, Gaskets	-	lot	-	-	-	-	-	-
Install Flowmeter	-	-	2	50	100	-	-	\$100.00
3/4" Conduit (power)	20	feet	-	6.35/LF	127	1.62	32.40	\$159.40
#14 - 3 Conductor Wire	20	feet	-	.63/LF	12.60	.13	2.60	\$15.20
3/4" Conduit (signal)	20	feet	-	6.35/LF	127	1.62	32.40	\$159.40
#18 - 2 conductor Cable	20	feet	-	3.05/LF	61	1.85	37.00	\$98.00
TOTALS			2		\$427.60		\$2769.40	\$3,197.00

¹ Labor rates are estimated at \$50/hr/man.

² Meter costs are based on Eastech Badger list prices.

Magmeter



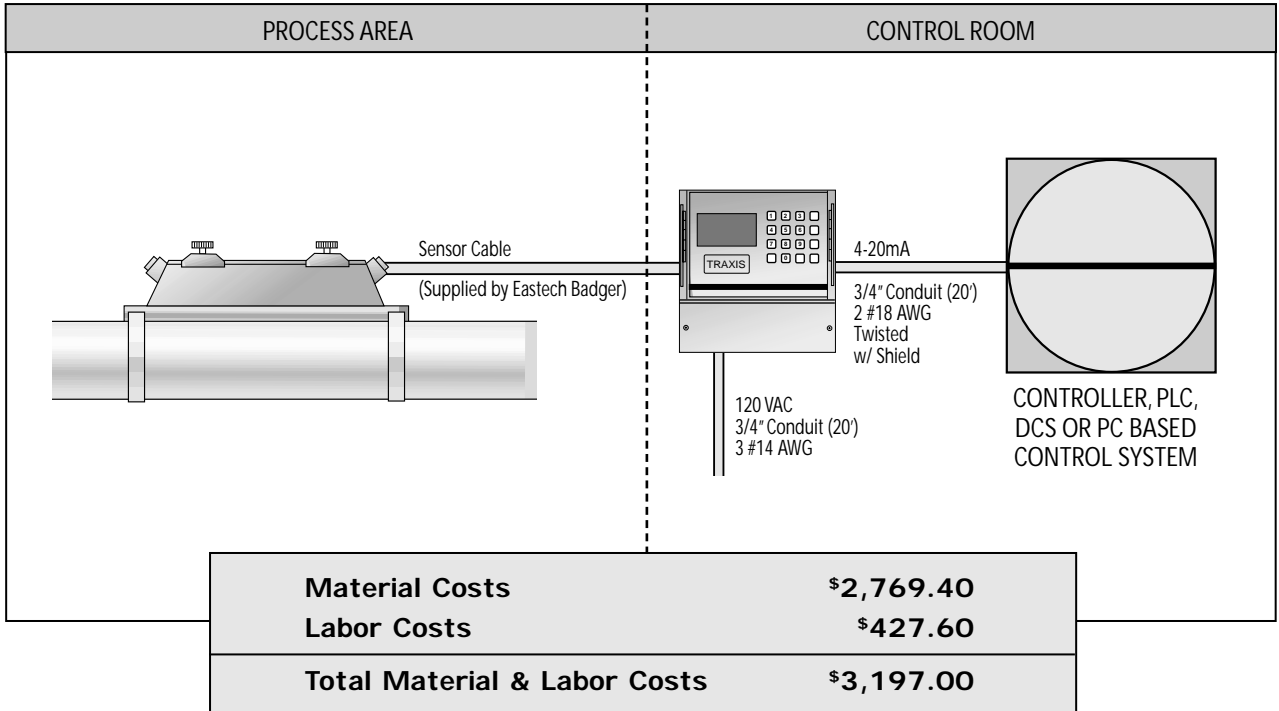
DETAILED COST ANALYSIS Class I Groups A, B, C, D, Class II, Groups F & G, Division 2

MATERIAL DESCRIPTION	TAKEOFF QUANTITY		INSTALLATION LABOR			MATERIAL		TOTAL L&M COST
	AMOUNT	UNIT	TOTAL HOURS	MH RATE ¹	LABOR COST	COST/UNIT	MATERIAL COST	
4" Magmeter (flanged)	1	each	-	-	-	-	3707.97 ²	\$3707.97
Cut Pipe	-	-	2	50	100	-	-	\$100.00
150 RF 304 Flanges	2	each	-	-	-	35.98	71.96	\$71.96
Weld Flanges	-	-	3	50	150	-	-	\$150.00
Bolts, Nuts, Gaskets	-	lot	-	-	-	-	48.74	\$48.74
Install Magmeter	-	-	3	50	150	-	-	\$150.00
3/4" Conduit (power)	30	feet	-	6.35/LF	190.50	1.62	48.60	239.10
#14 - 3 Conductor Wire	30	feet	-	.63/LF	18.90	.13	3.90	22.80
3/4" Conduit (signal)	100	feet	-	6.35/LF	635	1.62	162.00	\$797.00
#18 - 2 conductor Cable	100	feet	-	3.05/LF	305	1.85	185.00	\$490.00
TOTALS			8		\$1549.40		\$4228.17	\$5777.57

¹ Labor rates are estimated at \$50/hr/man.

² Meter costs are based on Foxboro list prices.

Ultrasonic



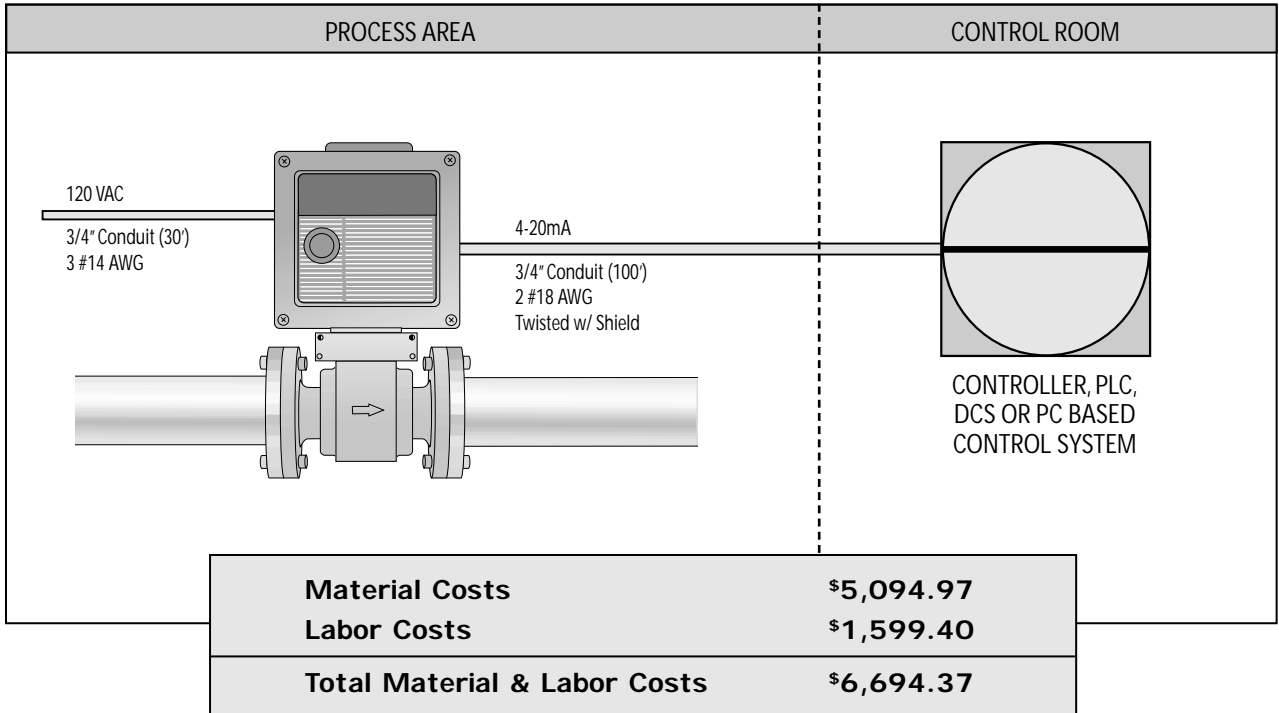
DETAILED COST ANALYSIS Class I Groups A, B, C, D, Class II, Groups F & G, Division 2

MATERIAL DESCRIPTION	TAKEOFF QUANTITY		INSTALLATION LABOR			MATERIAL		TOTAL L&M COST
	AMOUNT	UNIT	TOTAL HOURS	MH RATE ¹	LABOR COST	COST/UNIT	MATERIAL COST	
4" Ultrasonic Meter	1	each	-	-	-	-	2665.00 ²	\$2665.00
Cut Pipe	-	-	-	50	-	-	-	-
150 RF 304 Flanges		each	-	-	-	-	-	-
Weld Flanges	-	-	-	50	-	-	-	-
Bolts, Nuts, Gaskets	-	lot	-	-	-	-	-	-
Install Flowmeter	-	-	2	50	100	-	-	\$100.00
3/4" Conduit (power)	20	feet	-	6.35/LF	127	1.62	32.40	\$159.40
#14 - 3 Conductor Wire	20	feet	-	.63/LF	12.60	.13	2.60	\$15.20
3/4" Conduit (signal)	20	feet	-	6.35/LF	127	1.62	32.40	\$159.40
#18 - 2 conductor Cable	20	feet	-	3.05/LF	61	1.85	37.00	\$98.00
TOTALS			2		\$427.60		\$2769.40	\$3,197.00

¹ Labor rates are estimated at \$50/hr/man.

² Meter costs are based on Eastech Badger list prices.

Magmeter



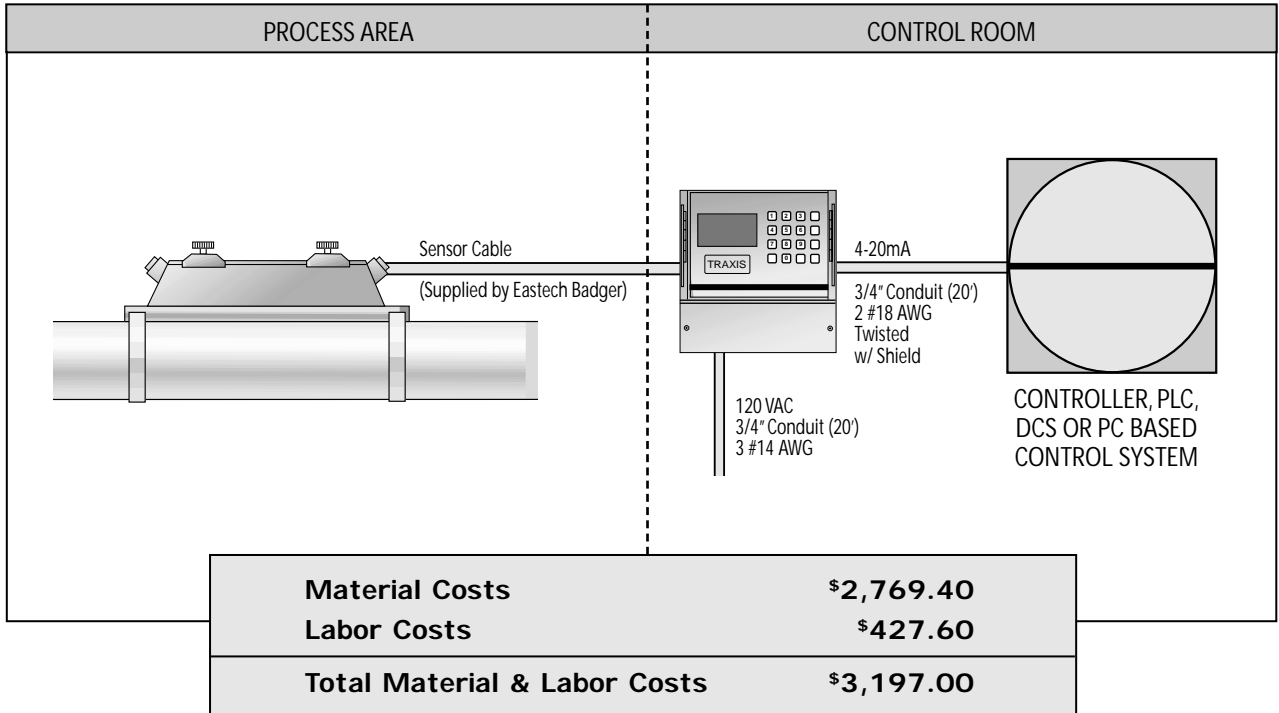
DETAILED COST ANALYSIS Class I Groups A, B, C, D, Class II, Groups F & G, Division 2

MATERIAL DESCRIPTION	TAKEOFF QUANTITY		INSTALLATION LABOR			MATERIAL		TOTAL L&M COST
	AMOUNT	UNIT	TOTAL HOURS	MH RATE ¹	LABOR COST	COST/UNIT	MATERIAL COST	
6" Magmeter (flanged)	1	each	-	-	-	-	4529.57 ²	\$4529.57
Cut Pipe	-	-	2	50	100	-	-	\$100.00
150 RF 304 Flanges	2	each	-	-	-	56.90	113.80	\$113.80
Weld Flanges	-	-	3	50	150	-	-	\$150.00
Bolts, Nuts, Gaskets	-	lot	-	-	-	-	52.10	\$52.10
Install Magmeter	-	-	4	50	200	-	-	\$200.00
3/4" Conduit (power)	30	feet	-	6.35/LF	190.50	1.62	48.60	239.10
#14 - 3 Conductor Wire	30	feet	-	.63/LF	18.90	.13	3.90	22.80
3/4" Conduit (signal)	100	feet	-	6.35/LF	635	1.62	162.00	\$797.00
#18 - 2 conductor Cable	100	feet	-	3.05/LF	305	1.85	185.00	\$490.00
TOTALS			9		\$1599.40		\$5094.97	\$6694.37

¹ Labor rates are estimated at \$50/hr/man.

² Meter costs are based on Foxboro list prices.

Ultrasonic



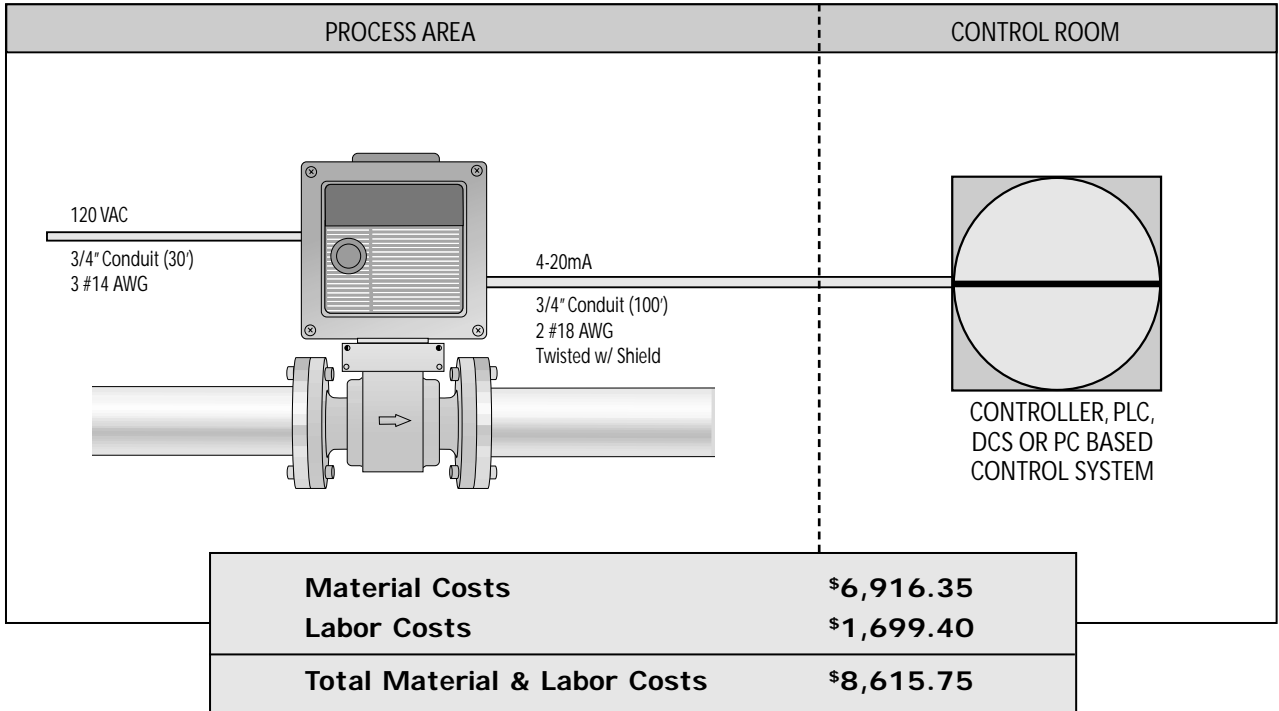
DETAILED COST ANALYSIS Class I Groups A, B, C, D, Class II, Groups F & G, Division 2

MATERIAL DESCRIPTION	TAKEOFF QUANTITY		INSTALLATION LABOR			MATERIAL		TOTAL L&M COST
	AMOUNT	UNIT	TOTAL HOURS	MH RATE ¹	LABOR COST	COST/UNIT	MATERIAL COST	
6" Ultrasonic Meter	1	each	-	-	-	-	2665.00 ²	\$2665.00
Cut Pipe	-	-	-	50	-	-	-	-
150 RF 304 Flanges		each	-	-	-	-	-	-
Weld Flanges	-	-	-	50	-	-	-	-
Bolts, Nuts, Gaskets	-	lot	-	-	-	-	-	-
Install Flowmeter	-	-	2	50	100	-	-	\$100.00
3/4" Conduit (power)	20	feet	-	6.35/LF	127	1.62	32.40	\$159.40
#14 - 3 Conductor Wire	20	feet	-	.63/LF	12.60	.13	2.60	\$15.20
3/4" Conduit (signal)	20	feet	-	6.35/LF	127	1.62	32.40	\$159.40
#18 - 2 conductor Cable	20	feet	-	3.05/LF	61	1.85	37.00	\$98.00
TOTALS			2		\$427.60		\$2769.40	\$3,197.00

¹ Labor rates are estimated at \$50/hr/man.

² Meter costs are based on Eastech Badger list prices.

Magmeter



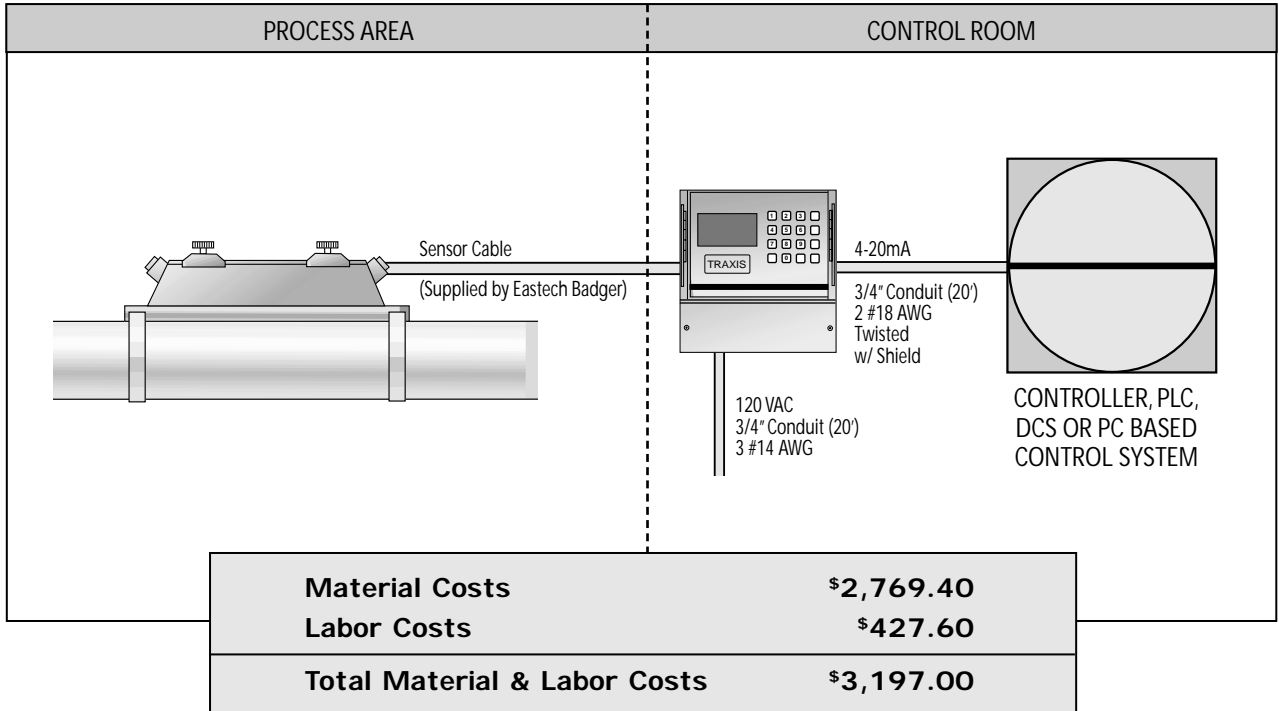
DETAILED COST ANALYSIS Class I Groups A, B, C, D, Class II, Groups F & G, Division 2

MATERIAL DESCRIPTION	TAKEOFF QUANTITY		INSTALLATION LABOR			MATERIAL		TOTAL L&M COST
	AMOUNT	UNIT	TOTAL HOURS	MH RATE ¹	LABOR COST	COST/UNIT	MATERIAL COST	
8" Magmeter (flanged)	1	each	-	-	-	-	6245.57 ²	\$6245.57
Cut Pipe	-	-	3	50	150	-	-	\$150.00
150 RF 304 Flanges	2	each	-	-	-	108.34	216.68	\$216.68
Weld Flanges	-	-	4	50	200	-	-	\$150.00
Bolts, Nuts, Gaskets	-	lot	-	-	-	-	54.60	\$54.60
Install Magmeter	-	-	4	50	200	-	-	\$200.00
3/4" Conduit (power)	30	feet	-	6.35/LF	190.50	1.62	48.60	239.10
#14 - 3 Conductor Wire	30	feet	-	.63/LF	18.90	.13	3.90	22.80
3/4" Conduit (signal)	100	feet	-	6.35/LF	635	1.62	162.00	\$797.00
#18 - 2 conductor Cable	100	feet	-	3.05/LF	305	1.85	185.00	\$490.00
TOTALS			11		\$1699.40		\$6916.35	\$8615.75

¹ Labor rates are estimated at \$50/hr/man.

² Meter costs are based on Foxboro list prices.

Ultrasonic



DETAILED COST ANALYSIS Class I Groups A, B, C, D, Class II, Groups F & G, Division 2

MATERIAL DESCRIPTION	TAKEOFF QUANTITY		INSTALLATION LABOR			MATERIAL		TOTAL L&M COST
	AMOUNT	UNIT	TOTAL HOURS	MH RATE ¹	LABOR COST	COST/UNIT	MATERIAL COST	
8" Ultrasonic Meter	1	each	-	-	-	-	2665.00 ²	\$2665.00
Cut Pipe	-	-	-	50	-	-	-	-
150 RF 304 Flanges		each	-	-	-	-	-	-
Weld Flanges	-	-	-	50	-	-	-	-
Bolts, Nuts, Gaskets	-	lot	-	-	-	-	-	-
Install Flowmeter	-	-	2	50	100	-	-	\$100.00
3/4" Conduit (power)	20	feet	-	6.35/LF	127	1.62	32.40	\$159.40
#14 - 3 Conductor Wire	20	feet	-	.63/LF	12.60	.13	2.60	\$15.20
3/4" Conduit (signal)	20	feet	-	6.35/LF	127	1.62	32.40	\$159.40
#18 - 2 conductor Cable	20	feet	-	3.05/LF	61	1.85	37.00	\$98.00
TOTALS			2		\$427.60		\$2769.40	\$3,197.00

¹ Labor rates are estimated at \$50/hr/man.

² Meter costs are based on Eastech Badger list prices.