City of Emmett Council Meeting

July 28, 2020

The Emmett City Council held a regular meeting at 501 E. Main Street, Emmett, Idaho.
Mayor Gordon Petrie called the meeting to order at 7:00p.m.
Mayor Gordon Petrie led the **Pledge of Allegiance**
Al Cinnamon offered the **Community Invocation**

Council Present: Council President Nebeker
Council Present via telephone: Councilor Gary Resinkin, Councilor Tona Henderson, Councilor Denise Sorenson, Councilor Thomas Butler
Staff Present: Lyleen Jerome, Mike Knittel, Stephanie Johnson
Staff present via telephone: Alyce Kelley, Steve Kunka, Clint Seamons, Brian Sullivan, Curt Christensen

Public Present via telephone: Brian Wahl - Motorola

Amendments to the Agenda: None.
Council President Nebeker made a MOTION TO APPROVE THE AGENDA. Seconded by Councilor Henderson. 5 – AYES, 0 – NOES. Motion Carried.

Declaration of Conflicts of Interest:
Declaration of Council Members' Discussion Outside an Open Meeting: None

ELECTED OFFICIALS:
A. Mayor -
B. City Council -
C. Announcements and Good of the Order –

CONSENT AGENDA:
A. Approval of Minutes – July 14, 2020 – Regular Council Meeting
B. Approval of Accounts Payable.

Councilor Henderson made a MOTION TO ACCEPT THE CONSENT AGENDA AS PRESENTED. Seconded by Councilor Resinkin. AYES -5, NOES - 0. Motion Carried.

NON-CONSENT AGENDA
BUSINESS:
A. Lyleen Jerome, City Clerk requests approval of the Quarterly Financial Report. **Councilor Henderson made a MOTION TO APPROVE THE QUARTERLY FINANCIAL REPORT AND PUBLISH ON THE CITY OF EMMETT WEBSITE. Seconded by Council President Nebeker. 5 - AYES, 0 - NOES. Motion Carried.**

B. **Approve Resolution R2020-07** – Clint Seamons, Public Works Director
A RESOLUTION ACCEPTING GRANT OFFER OF THE STATE OF IDAHO THROUGH IDAHO TRANSPORTATION DEPARTMENT, DIVISION OF AERONAUTICS, IN THE MAXIMUM AMOUNT OF $80,465.00. **Councilor Henderson made a MOTION TO APPROVE RESOLUTION R2020-07 A RESOLUTION ACCEPTING THE GRANT OFFER OF THE STATE OF IDAHO THROUGH IDAHO TRANSPORTATION DEPARTMENT, DIVISION OF AERONAUTICS, IN THE MAXIMUM AMOUNT OF $80,465.00 AND FOR THE MAYOR TO SIGN. Seconded by Council President Nebeker. COUNCIL PRESIDENT NEBEKER - AYE, COUNCILOR HENDERSON - AYE, COUNCILOR RESINKIN - AYE, COUNCILOR BUTLER - AYE, COUNCILOR SORENSON - AYE. Motion Carried.**

C. Clint Seamons, Public Works Director requests approval Grant Agreement - Idaho Airport Aid Program. **Council President Nebeker made a MOTION TO APPROVE THE GRANT AGREEMENT IN THE AMOUNT OF $80,465.00 AND FOR THE MAYOR TO SIGN. Seconded by Councilor Henderson. COUNCIL PRESIDENT NEBEKER - AYE, COUNCILOR HENDERSON - AYE, COUNCILOR RESINKIN - AYE, COUNCILOR BUTLER - AYE, COUNCILOR SORENSON - AYE. Motion Carried**

DEPARTMENT/ ACTIVITY REPORTS
A. **Building Official/City Planner** – Director Brian Sullivan – Gave report
B. **City Clerk** – Lyleen Jerome – Gave report
C. **Fire** – Chief Curt Christensen – Gave report
D. **Library** – Director Alyce Kelley – Gave report
E. **Police** – Chief Steve Kunka – Gave report and discussed the Motorola Project
F. **Public Works** – Director Clint Seamons – Gave report
G. **Systems Administrator** – Gave Report
H. **Engineer**

Councilor Henderson made a MOTION TO ADJOURN. Seconded by Councilor Butler. 5– AYES, 0 – NOES. Motion Carried.

Meeting Adjourned at 7:41p.m.

Mayor Gordon Petrie **Lyleen Jerome, City Clerk**

GALENA CONSULTING

To: Mayor Petrie, Members of the Emmett City Council

From: Anne Wescott, Galena Consulting

Date: August 6, 2020

Re: Capital Planning Briefing

I was retained by the City of Emmett to assist the Streets, Fire, Police, Building/P&Z, and IT Departments in developing long-range capital improvement plans (CIPs). We look forward to presenting these draft CIPs for your consideration and obtain your feedback and further direction.

Background

The development of a comprehensive long-term capital improvement program is a critical task for a growing community. A "blueprint" for sustaining and improving the City's infrastructure, these plans articulate the priority capital needs of the City, constrained to match available financial resources and competing funding needs; assist in the development of the annual capital budget, and enable elected officials to plan for needed expenditures and consider alternative funding sources; and communicate with the public how their tax dollars will be invested to enable the continued delivery of services.

The capital planning process begins with an assessment of the capital needs of each department identified by study findings (i.e., the Transportation Master Plan); current condition assessments, growth projections and industry-standards. These needs include:

- repair or replacement of existing assets
- upgrades to current assets
- safety needs
- response to needs of growth

The estimated cost for each project or purchase is identified, along with the assumed funding source. Estimated construction or purchase dates are provided in order to begin to convert the plan from a simple "list" to a long-range capital budget and construction schedule over a 10-year period of time. Finally, new operational costs are identified where applicable for each project, allowing elected officials and finance staff to ensure the capital and operating budget planning efforts are synchronized.

The CIP is a working document and should be reviewed and updated annually to reflect changing community needs, priorities, and funding opportunities to ensure that the infrastructure exists to advance the community's strategic and long-term goals and objectives.

Emmett Draft Capital Improvement Plans

Attached are draft CIPs for Streets, Fire, Police, Building/P&Z and IT. It is important to note that these are the departments' "first pass" at articulating their long-term capital needs. It is assumed that input from elected officials, city staff and members of the public will result in amendments to these plans before they are finalized.

You will notice that the Streets CIP looks somewhat different than the others. This is because the City has also retained my services to prepare an impact fee analysis for streets, and this format is needed to comply with state statute and create uniformity with the other impact fee studies being conducted concurrently in Gem County and the Rural Fire District #1.

During this briefing we will go through the justification for each project in these CIPs. It is important that these projects align with the policy objectives and direction of the elected officials, which is why your input will be essential. Estimated costs are based on current values; it is assumed an inflationary factor will be addressed each time the CIP is updated to reflect changes in the construction and durable goods markets. Projected years are based on needs and perceived funding availability.

After considering the importance of the projects themselves and their alignment with your policy objectives, the next point of focus is the cumulative cost of these plans. General Fud revenues are the most typical funding source for capital outlay. However, competing needs for these resources requires a "reality check" on the City's ability to fund the CIP. Other possible sources, including impact fees, contributions, exactions and grant funds, are identified as possible funding alternatives. Ultimately, the CIP should be fiscally constrained to balance with projected available revenues, which will be the next step in the capital planning process.

I look forward to meeting with you to discuss your capital needs and funding alternatives.

City of Emmett
DRAFT Streets Capital Improvement Plan, 2020-2029

Project	Year	Estimated Cost	Percent Impact Fee Eligible	Contributions & Exactions	Required City Match	Other Agency Costs	City Cost (Impact and City Funds)	Amount to include in Impact fees	Amount from Other City Sources
Roadways & Bridges									
South John's Avenue Reconstruction - 4th to 12th	2021	$ 3,000,000	35%	$ -	$ 220,237	$ 2,779,763	$ 220,237	$ 220,237	$ -
12th Street from Substation to Regency Reconstruction/Widening	2022	$ 1,250,000	65%	$ -	$ -		$ 1,250,000	$ 812,500	$ 437,500
Washington Avenue Mid-Block Pedestrian Crossings at 6th and 10th	2022	$ 150,000	0%	$ 75,000	$ -	$ -	$ 75,000	$ -	$ 75,000
Boise Avenue SH-52 to East Main Reconstruction	2022	$ 1,100,000	35%	$ -	$ -		$ 1,100,000	$ 385,000	$ 715,000
Substation Road and 12th Street Intersection	2023	$ 600,000	65%	$ -	$ -		$ 600,000	$ 390,000	$ 210,000
Reflective Traffic Signal Borders	2025	$ 4,000	0%	$ -	$ -	$ -	$ 4,000	$ -	$ 4,000
East Main from South Seneca to Riggs Avenue Reconstruction	2026	$ 735,000	45%	$ -	$ -		$ 735,000	$ 330,750	$ 404,250
4th Street Bridge Monte Vista Drive and Substation Road Rebuild	2026	$ 835,000	60%	$ -	$ -		$ 835,000	$ 501,000	$ 334,000
SH-16 Advance Signal Countdown Warnings	2026	$ 120,000	0%	$ -	$ 8,808	$ 111,192	$ 8,808	$ -	$ 8,808
Main Street Farmers Co-op Canal Bridge	2027	$ 1,100,000	50%	$ -	$ -	$ -	$ 1,100,000	$ 550,000	$ 550,000
12th and Washington Intersection Sight Distance Improvements	2028	$ 250,000	0%	$ -	$ 18,350	$ 231,650	$ 18,350	$ -	$ 18,350
4th Street from South John Avenue to Substation Road Reconstruction	2028	$ 1,250,000	60%	$ -	$ -		$ 1,250,000	$ 750,000	$ 500,000
ADA Curb Ramp Improvements	ongoing	$ 240,000	0%	$ -	$ -	$ -	$ 240,000	$ -	$ 240,000
Facilities									
City Shop/Administration Office	TBD	$ 2,400,000	33%	$ -	$ -	$ -	$ 2,400,000	$ 792,000	$ 1,608,000
Equipment									
Additional equipment for growth - street sweeper	2025	$ 350,000	100%	$ -	$ -	$ -	$ 350,000	$ 350,000	$ -
Replacement of existing equipment		$ 441,000	0%	$ -	$ -	$ -	$ 441,000	$ -	$ 441,000
		$ 13,825,000		**$ 75,000**	**$ 247,395**	**$ 3,122,605**	**$ 10,627,395**	**$ 5,081,487**	**$ 5,545,908**
Impact Fee Study		$ 8,000	100%	$ -	$ -	$ -	$ 8,000	$ 8,000	$ -
Transportation Master Plan Updates		$ 80,000	100%	$ -	$ -	$ -	$ 80,000	$ 80,000	$ -
		$ 13,913,000		**$ 75,000**	**$ 247,395**	**$ 3,122,605**	**$ 10,715,395**	**$ 5,169,487**	**$ 5,545,908**

City of Emmett Fire Department
DRAFT Capital Improvement Plan, 2020-2030

Type of Capital Infrastructure	Budget Year	Square Feet	Estimated Cost	Grant Funds Possible	General Fund	Annual Operating Impact
Facilities						
Joint Public Safety Building/Station #2	TBD	9,000	$ 3,600,000	$ -	$ 3,600,000	TBD
***impact fee eligible*						
Apparatus/Vehicles						
Additional engine for Station #2	TBD		$ 500,000	$ 250,000	$ 250,000	TBD
***impact fee eligible*						
Replace 1 Existing Engine	2025		$ 500,000	$ 250,000	$ 250,000	$ -
Replace 2 Existing Command vehicles	2025, 2030		$ 100,000	$ -	$ 100,000	$ -
Replace 2 Existing Brush Trucks (existing move to reserve status)	2025, 2030		$ 500,000	$ -	$ 500,000	$ -
Equipment						
SCBA Replacement	2028		$ 80,000	$ -	$ 80,000	$ -
Thermal Imager Replacement (2)	2025, 2030		$ 15,000	$ -	$ 15,000	$ -
Extrication Equipment	2030		$ 30,000	$ 27,000	$ 3,000	$ -
Hazmat Trailer Replacement	2030		$ 5,000	$ -	$ 5,000	$ -
Hose LDH			$ 18,000	$ -	$ 18,000	$ -
Air Compressor			$ 46,000	$ 23,000	$ 23,000	$ -
			$ 5,394,000	**$ 550,000**	**$ 4,844,000**	**$ -**

City of Emmett Police Department
DRAFT Capital Improvement Plan, 2020-2030

Type of Capital Infrastructure	Budget Year	Square Feet	Estimated Cost	Grant Funds Possible	General Fund	Annual Operating Impact
Facilities						
New Building - Joint Public Safety Facility	TBD	16,000	$ 6,400,000	$ -	$ 6,400,000	TBD
***partially impact fee eligible*						
Existing Station Repairs	2020-2023		$ 35,000	$ -	$ 35,000	$ 5,000
Vehicles						
Vehicles for 4 additional FTEs			$ 240,000	$ -	$ 240,000	$ -
***impact fee eligible*						
Scheduled replacement of existing Vehicles			$ 73,440	$ -	$ 73,440	$ -
Equipment/Technology						
Scheduled replacement of weaponry			$ 86,400	$ 21,600	$ 64,800	$ 6,000
Scheduled replacement of less lethal Tasers	2025-2028		$ 37,548	$ 1,500	$ 36,048	$ 7,600
Scheduled replacement of radios			$ 28,600	$ 5,400	$ 23,200	$ -
Body Camera cloud storage increase	2020-2030		$ 95,000	$ -	$ 95,000	$ 9,500
Records Management System Upgrades	2020-2030		$ 550,000	$ -	$ 550,000	$ 5,500
e-Citation Equipment (Printers & Laptops)	2027-2030		$ 12,000	$ -	$ 12,000	$ 4,000
Tasers/Less Lethal for additional officers			$ 8,344	$ -	$ 8,344	$ -
***impact fee eligible*						
Weaponry for additional officers			$ 19,200	$ -	$ 19,200	$ -
***impact fee eligible*						
Radios for additional officers			$ 7,200	$ -	$ 7,200	$ -
***impact fee eligible*						
			$ 7,592,732	**$ 28,500**	**$ 7,564,232**	**$ 37,600**

City of Emmett Building/Planning/Zoning Department
DRAFT Capital Improvement Plan, 2020-2030

Type of Capital Infrastructure	Budget Year	Square Feet	Estimated Cost	General Fund	Annual Operating Impact
Facilities					
Building/Zoning Administration	TBD	1,000	$ 400,000	$ 400,000	TBD
Vehicles					
Replacement of staff vehicle	2026		$ 20,000	$ 20,000	$ -
			$ 420,000	**$ 420,000**	**$ -**

City of Emmett IT Department
DRAFT Capital Improvement Plan, 2020-2030

Type of Capital Infrastructure	Budget Year	Estimated Cost	Fiberoptic Tech Fund	General Fund	Annual Operating Impact
Facilities					
Water Tower Hut Replacement/Repairs (Built 2017)	2027	$ 15,000	$ 15,000	$ -	$ -
Well 9 Hut Replacement/Repairs (Built 2019)	2029	$ 15,000	$ 15,000	$ -	$ -
5 New Fiberoptic Huts		$ 100,000	$ 100,000	$ -	$ -
Vehicles					
Dodge Charger		$ 25,000	$ -	$ 25,000	$ -
Ford Ranger		$ 25,000	$ -	$ 25,000	$ -
Tacoma		$ 25,000	$ -	$ 25,000	$ -
Equipment/Technology Replacement Every 3-5 years					
70 Cameras	3yr rotation	$ 31,500	$ -	$ 31,500	$ -
45 WiFi Radios	3yr rotation	$ 27,000	$ -	$ 27,000	$ -
50 Desktop Computers	5yr rotation	$ 80,000	$ -	$ 80,000	$ -
45 Laptops/Chromebooks	5yr rotation	$ 81,000	$ -	$ 81,000	$ -
5 Servers	5yr rotation	$ 70,000	$ -	$ 70,000	$ -
45 Network Switches	2027	$ 27,000	$ -	$ 27,0	
47 IP Desk Phones x47 @$700	2028	$ 32,900	$ -	$ 32,900	$ -
Fiber splicer	2028	$ 7,000	$ -	$ 7,000	$ -
Equipment/Technology Annual Licenses and SAAS					$ 381,400
		$ 561,400	**$ 130,000**	**$ 431,400**	**$ 381,400**

This represents 10 years of the annual licenses etc.

PIPER | SANDLER

March 24, 2020

City of Emmett

Bond Bank Bond Refinancing Update

Eric Heringer
MANAGING DIRECTOR
Tel: +1 208-344-8561
Email: eric.heringer@psc.com

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The information contained herein may include hypothetical interest rates or interest rate savings for a potential refunding. Interest rates used herein take into consideration conditions in today's market and other factual information such as credit rating, geographic location and market sector. Interest rates described herein should not be viewed as rates that Piper Sandler expects to achieve for you should we be selected to act as your underwriter or placement agent. Information about interest rates and terms for SLGs is based on current publically available information and treasury or agency rates for open-market escrows are based on current market interest rates for these types of credits and should not be seen as costs or rates that Piper Sandler could achieve for you should we be selected to act as your underwriter or placement agent. More particularized information and analysis may be provided after you have engaged Piper Sandler as an underwriter or placement agent or under certain other exceptions as describe in the Section 15B of the Exchange Act.

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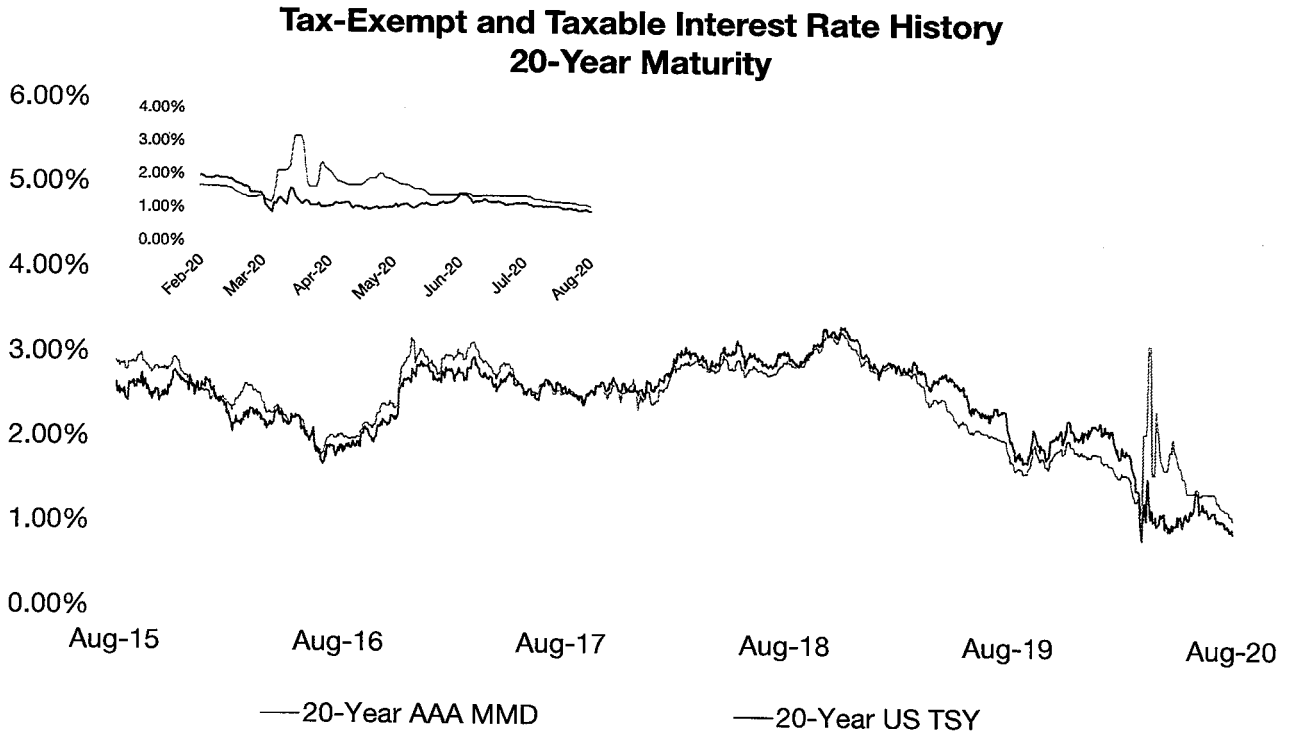
Interest Rates



Summary of Refunding Analysis

Refunding Candidates – City of Emmett Water & Sewer Revenue Bonds

	Series 2012A	Series 2012B	Series 2012C	Series 2013A
Issued to	USDA-RD	Bond Bank	Bond Bank	Bond Bank
Callable Principal	$2,225,276	$6,840,000	$1,100,000	$1,000,000
Callable Maturities	2021-2041	2023-2040	2041	2042
Average Coupon	3.00%	4.05%	4.00%	3.50%
Call Date	Anytime	9/15/2022	9/15/2022	9/15/2023

Refunding Savings Analysis Update – Level Savings Structure

Series 2012A	2/28/2020	8/4/2020
All-In True Interest Cost	2.37%	**2.20%**
Cash Flow Savings	$116,126	**$207,226**
Net Present Value Savings $	$124,564	**$186,673**
Net Present Value Savings %	5.60%	**8.29%**

Series 2012C	2/28/2020	8/4/2020
All-In True Interest Cost	2.84%	**2.71%**
Cash Flow Savings	$159,419	**$231,888**
Net Present Value Savings $	$121,241	**$165,457**
Net Present Value Savings %	11.02%	**15.04%**

Series 2012B	2/28/2020	8/4/2020
All-In True Interest Cost	2.29%	**2.08%**
Cash Flow Savings	$895,720	**$1,248,997**
Net Present Value Savings $	$729,480	**$896,360**
Net Present Value Savings %	10.66%	**13.10%**

Series 2013A	2/28/2020	8/4/2020
All-In True Interest Cost	2.86%	**2.70%**
Cash Flow Savings	$15,891	**$75,001**
Net Present Value Savings $	$14,033	**$44,381**
Net Present Value Savings %	1.40%	**4.44%**

The updated 8/4/2020 analysis assumes that $800,000 Debt Service Reserve Fund is contributed to the refinancing which lowers the principal amount needed to refinance each series of bonds.

Annual Savings Analysis – Level Savings

- Savings Analysis based on interest rates as of 8/4/2020
- Includes contribution of the existing Debt Service Reserve Fund in the amount of $800,000 to pay down a portion of the debt

Calendar Year	Combined Existing Bond Payments	Combined Bond Payments After Refunding	Refunding Savings
2021	783,776	$680,264	103,512
2022	781,026	$683,488	97,538
2023	782,776	$682,638	100,138
2024	783,776	$681,038	102,738
2025	784,026	$683,738	100,288
2026	783,526	$685,438	98,088
2027	780,526	$681,188	99,338
2028	782,126	$681,188	100,938
2029	783,126	$685,238	97,888
2030	783,526	$683,088	100,438
2031	783,326	$684,938	98,388
2032	782,526	$684,229	98,297
2033	781,126	$682,815	98,311
2034	779,126	$685,789	93,337
2035	781,526	$682,932	98,594
2036	783,126	$684,551	98,575
2037	778,926	$685,310	93,616
2038	779,126	$683,662	95,464
2039	783,526	$681,554	101,972
2040	781,926	$683,988	97,938
2041	779,526	$685,903	93,623
2042	1,176,326	$682,230	494,096
Totals	**17,598,322**	**15,035,210**	**2,563,112**
			(800,000) DSRF Contribution
			1,763,112 Net Cash Flow Savings

Annual Savings Analysis – Keep combined payments the same and shorten amortization

- Savings Analysis based on interest rates as of 8/4/2020
- Includes contribution of the existing Debt Service Reserve Fund in the amount of $800,000 to pay down a portion of the debt

Calendar Year	Combined Existing Bond Payments	Combined Bond Payments After Refunding	Refunding Savings
2021	783,776	776,665	7,111
2022	781,026	781,760	(734)
2023	782,776	781,510	1,266
2024	783,776	780,260	3,516
2025	784,026	778,060	5,966
2026	783,526	779,860	3,666
2027	780,526	780,460	66
2028	782,126	779,860	2,266
2029	783,126	778,010	5,116
2030	783,526	779,960	3,566
2031	783,326	780,460	2,866
2032	782,526	782,096	430
2033	781,126	782,924	(1,798)
2034	779,126	782,811	(3,685)
2035	781,526	781,737	(211)
2036	783,126	779,972	3,154
2037	778,926	777,210	1,716
2038	779,126	781,464	(2,338)
2039	783,526	130,000	653,526
2040	781,926	0	781,926
2041	779,526	0	779,526
2042	1,176,326	0	1,176,326
Totals	**17,598,322**	**14,175,083**	**3,423,239**
			(800,000) DSRF Contribution
			2,623,239 Net Cash Flow Savings

Refunding Savings Analysis Update

Combined Savings

	2/28/2020 (Level)	8/4/2020 (Level)	8/4/2020 (Accelerated)
Cash Flow Savings	$1,180,000	$1,763,112	$2,623,239
Net Present Value Savings	$939,300	$1,292,871	$1,684,881

Tentative Bond Bank Financing Schedule

Bond Bank 2020 Financing Schedule	
July 20	Refinancing application approved at IBBA Board Meeting
August 25	City of Emmett considers approval of Bond Ordinance (authorizing bond refinance subject to parameters)
September 23	Bond Bank Pricing (lock interest rates)
October 5	Bond Closing (redeem prior bonds)

Parameters Resolution

The Bond Ordinance is prepared by Emmett's Bond Attorney (MSBT Law). It delegates authority to complete the bond refinancing to City Officials (the Mayor and City Clerk) to approve the final pricing terms on the Bonds subject to the following parameters:

	2020A Loan (Tax-Exempt) Refinance USDA Loan	2020B Loan (Taxable) Refinance Bond Bank Loans
Not to Exceed Final Maturity	9/15/2041	9/15/2042
Not to Exceed Principal Amount	$2,252,000 (need to confirm)	$8,940,000
Not to Exceed All-In TIC	2.50%	3.00%

Estimated Costs of Issuance

The following estimated costs of issuance have been included in the updated 8/4/2020 refinancing analysis. The All-In TIC reflects these costs. All costs will be paid from the proceeds of the Bond Bank Loan and the estimated savings amounts include payment of these costs.

Role	Provider	2020A (Tax-Exempt)	2020B (Taxable)
Bond Bank Municipal Advisor	PFM	$3,196	$17,607
Bond Bank Bond Counsel	Skinner Fawcett	$3,653	$22,888
Rating Agency	Moody's	$2,922	$11,268
Trustee	Zions Bank	$441	$702
Official Statement Publisher	TBD	$228	$880
Escrow Costs	TBD	$0	$6,000
IBBA Admin Fee	Bond Bank	$2,864	$11,048
City Bond Counsel	MSBT Law	$15,250	$29,750
Underwriting*	Piper Sandler	$10,263	$43,589
	Total	**$38,817**	**$143,732**

* Underwriting fee estimated at 0.520% of bond amount (0.320% takedown plus 0.20% management)

ORDINANCE #O2020-10

AN ORDINANCE TITLED THE ANNUAL APPROPRIATION ORDINANCE FOR THE FISCAL YEAR BEGINNING OCTOBER 1, 2020 APPROPRIATING THE SUM OF $8,276,739 TO DEFRAY THE EXPENSE AND LIABILITIES OF THE CITY OF EMMETT, IDAHO FOR SAID FISCAL YEAR, AUTHORIZING A LEVY OF A SUFFICIENT TAX UPON THE TAXABLE PROPERTY AND SPECIFYING THE OBJECTS AND PURPOSES FOR WHICH SAID APPROPRIATION IS MADE.

BE IT ORDAINED by the Mayor and City Council of Emmett, Gem County, Idaho.

Section 1: That the sum of $8,276,739 be, and the same is appropriated to defray the necessary expenses and liabilities of the City of Emmett, Gem County, Idaho for the fiscal year beginning October 1, 2020.

Section 2: The objects and the purposes for which such appropriation is made, and the amount of each object and purpose is as follows:

ESTIMATED EXPENDITURES:

GENERAL FUND	AMOUNT APPROPRIATED	AMOUNT TO BE RAISED FROM TAXES
City Council	$ 88,264	
Executive	$ 34,316	
City Clerk	$ 136,858	
City Attorney	$ 78,975	
Planning & Zoning	$ 4,000	
Police Department	$ 1,368,740	
Fire Department	$ 275,482	
Building Official	$ 135,403	
Airport	$ 19,210	
Parks	$ 128,635	
IT	$ 338,100	
TOTAL GENERAL FUND APPROPRIATIONS	**$ 2,607,983**	**$ 1,575,247**
SPECIAL FUNDS	**AMOUNT APPROPRIATED**	**AMOUNT TO BE RAISED FROM TAXES**
Road and Street	$ 526,143	$ 79,017
Library	$ 249,068	$ 189,263
Perpetual Care	$ 3,100	
Cemetery	$ 113,180	$ 37,814
Water	$ 1,781,121	
Sewer	$ 2,324,494	
Sanitation	$ 660,350	
Technology Fund	$ 6,000	
Projects	$ 5,300	
TOTAL FUND APPROPRIATIONS	**$ 5,668,756**	**$ 306,094**
TOTAL EXPENSES	**$ 8,276,739**	**$ 1,881,341**

Section 3: That a general tax levy on all taxable property within the City of Emmett be levied in an amount allowed by law for the general purposes for said City, for the fiscal year beginning October 1, 2020.

Section 4: All ordinances and parts of ordinances in conflict with this ordinance are hereby repealed.

Section 5: This ordinance shall take effect and be in full force upon its passage, approval and publication in one issue of the Messenger Index, a newspaper of general circulation in the City of Emmett, and the official newspaper of the City.

PASSED under suspension of rules upon which a roll call vote was taken and duly enacted an Ordinance of the City of Emmett, Gem County, Idaho at a convened meeting of the City of Emmett City Council held the 11th day of August 2020.

ATTEST:

Mayor Gordon Petrie

Lyleen Jerome, City Clerk

EMMETT POLICE DEPARTMENT

501 E. Main Street – Emmett, ID 83617
Fax: 208-365-6062 Phone: 208-365-6055
Chief Steve Kunka

To: Emmett City Council & Mayor

From: Chief Steve Kunka

RE: Request for funding from Usable Fund Balance / Spillman

Date: August 4, 2020

The City of Emmett Police Department seeks a motion to approve the contract and purchase of Motorola Flex to upgrade the police department's record management system. The purchase for Motorola Flex is $46,607.36.

As part of the requested motion, we are seeking to use $26,607 in the current Usable Fund Balance to pay for the new records management system. The police department will have $20,000 within our existing FY19-20 budget to offset the remaining costs.

This is a shared agency agreement with Gem County which will give the city the same rights and licenses to use as purchased by the county that will enhance services between the city and county. Motorola Flex will be replacing Computer Arts, which is currently failing the needs of both the city and county.

By joining Gem County with this plan, we will save approximately $35,000 compared to implementing the plan independently from the county.

Emmett Police Department
Purchased Products and Services

Total Cost	Price
Sub Total	$51,965.10
Total Discount	$5,357.74

***This pricing is valid until August 27th.*

Maintenance

Inclusions	Annual Maintenance
Emmett Police Department	$5,107.99

*** The first year of maintenance is included in the original Purchase.*

Hardware

Module	Quantity	Price
Barcode Equipment Bundle	1	$2,375.57

Mobile

Module	License	Price
Mobile Arrest Form	Site License	$2,817.66
Mobile Field Report with Field Interview	Site License	$3,666.99

Other

Module	License	Price
XML Citation Interface	Site License	$2,281.96
Vault/Judicial Sharing-250 Gb	Site License	$362.26

Records

Module	License	Price
Traffic Information	Site License	$2,213.95
Law Records	Site License	$7,371.66
Evidence Barcode and Auditing	Site License	$1,360.52
NIBRS	Site License	$5,083.91
Evidence Management	Site License	$2,213.95
Hub	Site License	$16,858.93

Product Breakdown Per Agency

The following tables represent the breakdown of modules per Agency and the cost associate for those modules related to that agency. These numbers have been broken down for budgetary reasons only, and do not reflect the amount(s) of total contract, but rather reflect the portion of the contract that is made up by each agency.

Emmett Police Department	Price
Barcode Equipment Bundle	Vault-250Gb
Evidence Barcode and Auditing	Evidence Management
Hub	Law Records
Mobile Arrest Form	Mobile Field Report with Field Interview
NIBRS	XML Citation Interface
Traffic Information	

Payment Milestone	Payment
1. Execution of Contract	20%
2. Completion of the Project Kickoff and Contract Design Review	20%
3. Completion of Admin Training- After November 1st	35%
4. Completion of End User Training	10%
5. Successful Completion of System Live Cut	10%
6. Final Acceptance	5%

This Purchase Agreement ("Agreement") is made and entered into by and between the Customer and Motorola Solutions, Inc. ("Motorola"), 4625 Lake Park Blvd, Salt Lake City, UT 84120.

The terms agreed to in the previous purchase of software for the CAD components with the Gem County Sheriff's Office will apply to this agreement as well.

Emmett Police Department	
Customer	Authorized Signature
Date	Print Name and Title

EMMETT PUBLIC WORKS DEPARTMENT
601 East 3rd Street - Emmett, Idaho 83617
Clint Seamons, Public Works Director

Thursday, August 06, 2020

Mayor, City Council:

I am requesting from City Council a **MOTION to approve Notice of Award for 12th Street Booster Station to PumpTech Inc in the amount of $336,110.00 with Mayor to sign.**

Attached is the Notice of Award and BIDS received for your review.

Thank you,

Clint Seamons
Public Works Director

NOTICE OF AWARD

Date of Issuance:	08/11/2020	
Owner:	City of Emmett 601 E. 3rd St. Emmett, ID 83617	
Engineer:	Keller Associates 131 SW 5th Ave., Meridian, ID 83642	Engineer's Project No.: 210022-059
Project:	12th Street Booster Station	
Bidder:	PumpTech Inc.	
Bidder's Address:	665 Best Business Ave., Suite 101 Kuna, ID 83634	

TO BIDDER:

You are notified that Owner has accepted your Bid dated July 22, 2020 for the above Contract, and that you are the Successful Bidder and are awarded a Contract for:

City of Emmett 12th Street Booster Station Bid Schedule 1 and Bid Schedule 2, as detailed in Contract Documents and Specifications.

The Contract Price of the awarded Contract is: $ 336,110.00

Two (2) unexecuted counterparts of the Agreement accompany this Notice of Award, and one copy of the Contract Documents accompanies this Notice of Award or has been transmitted or made available to Bidder electronically.

☐ a set of the Drawings will be delivered separately from the other Contract Documents.

You must comply with the following conditions precedent within 15 days of the date of receipt of this Notice of Award:

1. Deliver to Owner two (2) counterparts of the Agreement, fully executed by Bidder.
2. Deliver with the executed Agreement(s) the Contract security (Performance and Payment Bonds) and insurance documentation as specified in the Instructions to Bidders and General Conditions, Articles 2 and 6.

Failure to comply with these conditions within the time specified will entitle Owner to consider you in default, annul this Notice of Award, and declare your Bid security forfeited.

Within ten days after you comply with the above conditions, Owner will return to you one fully executed counterpart of the Agreement, together with any additional copies of the Contract Documents as indicated in Paragraph 2.02 of the General Conditions.

Owner: City of Emmett

Authorized Signature

By:

Title:

Copy: Engineer

PumpTech Inc.
665 Best Business Ave., Ste. 101
Kuna, ID 83634
208-473-1068
Rich Culley
RCulley@pumptechnw.com

July 22, 2020
Project #147549

Attn: Keller Engineering & City of Emmett
Re: 12th Street Booster Station

PumpTech Inc. is pleased to offer this scope for your consideration on the referenced project with the following equipment:

Qty. 1) PES Model 704, UL QCZJ listed, prefabricated water booster station on a powder coated steel base with pumps, motors, and piping. Skid will have space for future third duty pump, capped off with blind flanges. Complete skid will be factory installed in a cast concrete building with fully wired control panel, house electrical, ready for operation prior to shipment to job site. Station to meet initial demands of 0-1,840 GPM at 80psi and future demands of 0-2,010 GPM at 80psi.

BUILDING: 10.5'x24' CXT Schweitzer cast concrete utility building, broom finish roof, exposed aggregate finish walls, 6068 galvanized steel door and frame, lever handle passage latch, insulated walls with ¾" CDX plywood to local code, mechanical louver wall vent, and LED lights; includes PE stamped drawings and state building design review with inspections.

PUMPS: Qty 2) Duty Pumps: Paco LC 15705, 15HP, Duty Point 170 GPM @ 134' TDH
Qty 2) High Flow Pumps: Paco LC 50157, 75HP, Duty Point 1,500 GPM @ 134' TDH

PIPING: All piping shall be sch40 316SS with 8" headers and 150# flange connections. Suction and discharge gauges and transducers to be provided, as well as lugged butterfly isolation valves, wafer check valves, and a 3" Cla-Val PRV line back to suction. 370 gallon expansion tank piped to discharge line, and 8" mag flow meter with required straight run before and after. All piping to be fully supported. ARI air relief valve to be provided on common discharge header. Manual drains will be provided on suction and discharge header. Spare ports can be provided upon request.

SENSORS: Danfoss pressure transducers to be provided on the suction and discharge headers with local 4" SS pressure gauges. An 8" Krohne Enviromag flow to be provided on the common discharge header. An ultrasonic liquid level switch to be installed on the suction header to provide dry run protection.

POWER: Three phase, 60Hz, 460V

PANEL: UL listed Nema 12 enclosure, PLC controlled, with 400A main circuit breaker with door operating handle, HOA switches, speed potentiometers, red alarm lights, green run lights, audible alarm, e-stop, Allen-Bradley PowerFlex VFDs for all pumps with third 15HP VFD for future duty pump addition, panel mounted VFD keypads, side mounted cooling unit, transformer, power supply, circuit breakers, fuses, control relays and terminals for field connections. Includes Allen-Bradley Compact Logix 5069 controller, 6.5" Panelview Plus 7 touch screen with custom programming to run a municipal booster system per specification sequence of operations.

SOFTWARE: One Allen-Bradley RSLOGIX 5000 Lite PLC programming software license, and one Allen-Bradley Studio View HMI programming software license to be provided, per specification.

GENERATOR: Cummins 60Hz, 200kW, Diesel Genset, per specification, to be shipped loose to the job site

ATS: Cummins service entrance transfer switch, 300A/400A/600A, per specification, to be shipped loose to the job site

LISTING: UL listed category QCZJ package pumping systems "inclusive of entire system."

SPARES: None Provided

STARTUP & TRAINING: Startup and training is included, per specification

NOTES & EXCEPTIONS: Storage, excavation, backfill, unloading, site work or electrical and piping connections to the building are not included in this scope of supply

Estimated Unit Weight is ~75,000lbs with Building and Pumps

Sincerely,

Rich Culley
PumpTech, Inc.

BID FORM

PROJECT IDENTIFICATION: City of Emmett

12th Street Booster Station

CONTRACT IDENTIFICATION NUMBER:

1.01 This Bid is submitted to: **City of Emmett**

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into a Contract with Buyer in the form included in the Bidding Documents to furnish the Goods and Special Services as specified or indicated in the Bidding Documents, for the prices and within the times indicated in this Bid, and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 - BIDDER'S ACKNOWLEDGMENTS

2.01 Bidder accepts all of the terms and conditions of the Notice Inviting Bids and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 45 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Buyer.

2.02 Bidder acknowledges that this Contract, if awarded, may be assigned by the Owner to the Installing Contractor, and hereby consents to the assignment under the terms and conditions of the Pre-Purchase Documents.

ARTICLE 3 - BIDDER'S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, the related data identified in the Bidding Documents, and the following Addenda, receipt of which is hereby acknowledged:

Addendum Date	Addendum Number	Initials
July 1, 2020	1	

B. Bidder has visited the Point of Destination and site where the Goods are to be installed or Special Services will be provided and become familiar with and is satisfied as to the observable local conditions that may affect cost, progress, or the furnishing of Goods and Special Services, if required to do so by the Bidding Documents, or if, in Bidder's judgment, any local condition may affect cost, progress, or the furnishing of Goods and Special Services.

C. Bidder is familiar with and is satisfied as to all Laws and Regulations in effect as of the date of the Bid that may affect cost, progress, and the furnishing of Goods and Special Services.

D. Bidder has carefully studied, considered, and correlated the information known to Bidder; information commonly known to sellers of similar goods doing business in the locality of the Point of Destination and the site where the Goods will be installed or where Special Services will be provided; information and observations obtained from Bidder's visits, if any, to the Point of Destination and the site where the Goods will be installed or Special Services will be provided; and any reports and drawings identified in the Bidding Documents regarding the Point of Destination and the site where the Goods will be installed or where Special Services will be provided, with respect to the effect of such information, observations, and documents on the cost, progress, and performance of Seller's obligations under the Bidding Documents.

E. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, and discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution (if any) thereof by Engineer is acceptable to Bidder.

F. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for furnishing the Goods and Special Services for which this Bid is submitted.

ARTICLE 4 - BIDDER'S CERTIFICATIONS

4.01 Bidder certifies that:

A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;

B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;

C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and

D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Buyer, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Buyer of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Buyer, a purpose of which is to establish bid prices at artificial, non-competitive levels; and

4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process.

ARTICLE 5 - BASIS OF BID

5.01 Bidder will furnish the Goods and Special Services in accordance with the Contract Documents for the following price(s). Vendors may provide bids for one or more of the following base bid items. State of Idaho taxes shall not be included (Section 00800 – Supplementary Conditions 5.05.A).

1	**PACKAGED BOOSTER STATION** consisting of the following:

A. EQUIPMENT: The Vendor shall provide one (1) domestic water packaged booster station meeting the requirements of these contract documents including specification 22 11 23.13 (some components are specified in other sections). It shall include a variable speed packaged pumping system, pressure tank, control panel, and all associated piping, valves, electrical and control wiring and instrumentation required for a complete and operable system.

B. SPECIAL SERVICES - STARTUP AND TRAINING: As defined in Section 01 43 33 and Section 01 75 16.

Bid Item	Approximate Quantity	Unit	Bid Price	Amount Bid
Packaged Booster Station Price[1]	1	LS	$276,588.00	$ 276,588.00
Booster Station Foundation Cash Allowance[2]		LS	$5,000	$ Not Applicable
Lump Sum – Packaged Booster Station Bid Price[3]			$ 276,588.00 (Amount in Figures)	

Two hundred seventy six thousand five hundred eighty eight dollars

(Amount in Words)

(Amount shall be shown in both words and figures. In case of discrepancy, the amount shown in words shall govern.)

Notes:
1. This is the contract amount that will be included in the agreement and assigned to an Installation Contractor, if desired by the Owner.
2. Booster Station Foundation Cash Allowance to be included if required by building manufacturer. Cost included is cost for Owner to install foundation for building at job site.
3. This is the bid amount that will be used by the Owner for comparison purposes to award the Packaged Booster Station.

2	**GENERATOR** consisting of the following:
A. EQUIPMENT: The Vendor shall provide one (1) diesel-driven standby power generator, meeting the requirements of these contract documents including specification 26 32 13 and 26 36 00. It shall include generator engine starting systems including batteries, instrument control panel, transfer switches, annunciator panel, exhaust silencer, and accessories required for a complete generator installation	
B. SPECIAL SERVICES - STARTUP AND TRAINING: As defined in Section 01 43 33 and Section 01 75 16.	
Lump Sum Bid Price for Generator and associated components. (This is the contract amount that will be included in the agreement and assigned to an Installation Contractor, if desired by the Owner)	$ 59,522.00 (Amount in Figures) Fifty nine thousand five hundred + twenty two dollars (Amount in Words) (Amount shall be shown in both words and figures. In case of discrepancy, the amount shown in words shall govern.)

ARTICLE 6 - TIME OF COMPLETION

6.01 Bidder agrees that the furnishing of Goods and Special Services will conform to the schedule set forth in Article 5 of the Agreement.

6.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 7 - ATTACHMENTS TO THIS BID

7.01 The following documents are attached to and made a condition of this Bid:

A. Required Bid security (if using bid bond, use form included in bid package);

B. Building floor plan and elevations of all four sides of the building;

C. Mechanical plan (plan view and side view(s)); and

D. Proposed materials for booster station including, building material/supplier, duty pump manufacturer, high flow pump manufacturer, controls component manufacturer, weight of facility, and recommended building installation instructions.

ARTICLE 8 - DEFINED TERMS

8.01 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 9 - BID SUBMITTAL

9.01 This Bid submitted by:

If Bidder is:

An Individual

Name (typed or printed): Richard Culley

By: _____

(Individual's signature)

Doing business as: PumpTech Inc.

Business address: 665 Best Business Ave. Suite 101
Kuna Idaho 83634

Phone: 208-954-9747 Facsimile: _____

E-mail address: rculley@pumptechNW.com

A Partnership

Partnership Name: _____

(SEAL)

By: _____

(Signature of general partner - attach evidence of authority to sign)

Name (typed or printed): _____

Business address: _____

_____

Phone: _____ Facsimile: _____

E-mail address: _____

A Corporation

Corporation Name: PumpTech, Inc.

State of Incorporation: Washington

Type (General Business, Professional, Service, other): Pump system manufacturer + supplier

By: [signature]

(Signature - attach evidence of authority to sign)

Name (typed or printed): Doug Davidson

Title: President & owner

(CORPORATE SEAL)

Attest [signature]

(Signature of Corporate Secretary)

Business address: 12020 SE 32nd St. Suite 2
Bellevue, WA 98005

Phone: 425-644-8501 Facsimile: 425-562-9213

E-mail address: pumptechnw@pumptechnw.com

A Limited Liability Company (LLC)

LLC Name: _____

State in which organized: _____

By: _____

(Signature - attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Business address: _____

_____

Phone: _____ Facsimile: _____

E-mail address: _____

A Joint Venture

First Joint Venturer Name: _____
(SEAL)

By: _____

(Signature - attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Business address: _____

_____

Phone: _____ Facsimile: _____

E-mail address: _____

Second Joint Venturer Name: _____
(SEAL)

By: _____

(Signature - attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Business address: _____

_____

Phone: _____ Facsimile: _____

E-mail address: _____

Phone and Facsimile Number, and Address for receipt of official communications to Joint Venture: _____

_____

(Each joint venturer must sign. The manner of signing for each individual, partnership, corporation, and limited liability company that is a party to the joint venture should be in the manner indicated above.)

CITY OF EMMETT
12TH STREET BOOSTER STATION 210022-059

BID BOND (Penal Sum Form)

Any singular reference to Bidder, Surety, Owner or other party shall be considered plural where applicable.

BIDDER *(Name and Address)*:
PumpTech, Inc.
12020 SE 32nd St., Suite 2
Bellevue, WA 98005

SURETY *(Name, and Address of Principal Place of Business)*:
The Ohio Casualty Insurance Company
17771 Cowan Suite 200
Irvine, CA 92614

OWNER *(Name and Address)*:
The City of Emmett
601 E 3rd St.
Emmett, ID83617

BID
Bid Due Date: July 23, 2020
Description *(Project Name— Include Location)*:
12th Street Booster Station Project no. 210022-059 Emmett, ID

BOND
Bond Number: n/a
Date: July 23, 2020
Penal sum 5 % of the total bid proposal (Words) $ 5% (Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

BIDDER	SURETY
PumpTech, Inc. (Seal)	The Ohio Casualty Insurance Company (Seal)
Bidder's Name and Corporate Seal	Surety's Name and Corporate Seal
By: Felecia Soeldner	By:
Signature	Signature (Attach Power of Attorney)
Felecia Soeldner	Mary L. Faure'
Print Name	Print Name
Credit + Collections Controller	Attorney in fact
Title	Title
Attest:	Attest: Deborah Cook
Signature	Signature Deborah Cook
Title Billing Supervisor	Title Witness

THIS POWER OF ATTORNEY IS NOT VALID UNLESS IT IS PRINTED ON RED BACKGROUND.
This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

Certificate No. 7397453

American Fire and Casualty Company
The Ohio Casualty Insurance Company
Liberty Mutual Insurance Company
West American Insurance Company

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That American Fire & Casualty Company and The Ohio Casualty Insurance Company are corporations duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Catherine M. Fleck; Deborah Cook; Marianne L. Jackson; Mary L. Faure'; Patricia A. Fuqua

all of the city of Everett, state of WA each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 17th day of June, 2016.

American Fire and Casualty Company
The Ohio Casualty Insurance Company
Liberty Mutual Insurance Company
West American Insurance Company

By: _____
David M. Carey, Assistant Secretary

STATE OF PENNSYLVANIA ss
COUNTY OF MONTGOMERY

On this 17th day of June, 2016, before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of American Fire and Casualty Company, Liberty Mutual Insurance Company, The Ohio Casualty Insurance Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at Plymouth Meeting, Pennsylvania, on the day and year first above written.

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Teresa Pastella, Notary Public
Plymouth Twp., Montgomery County
My Commission Expires March 28, 2017
Member, Pennsylvania Association of Notaries

By: _____
Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-laws and Authorizations of American Fire and Casualty Company, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company which resolutions are now in full force and effect reading as follows:

ARTICLE IV – OFFICERS – Section 12. Power of Attorney. Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

ARTICLE XIII – Execution of Contracts – SECTION 5. Surety Bonds and Undertakings. Any officer of the Company authorized for that purpose in writing by the chairman or the president, and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary.

Certificate of Designation – The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

Authorization – By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Gregory W. Davenport, the undersigned, Assistant Secretary, of American Fire and Casualty Company, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 25th day of July, 2016.

By: _____
Gregory W. Davenport, Assistant Secretary

Not valid for mortgage, note, loan, letter of credit, currency rate, interest rate or residual value guarantees.

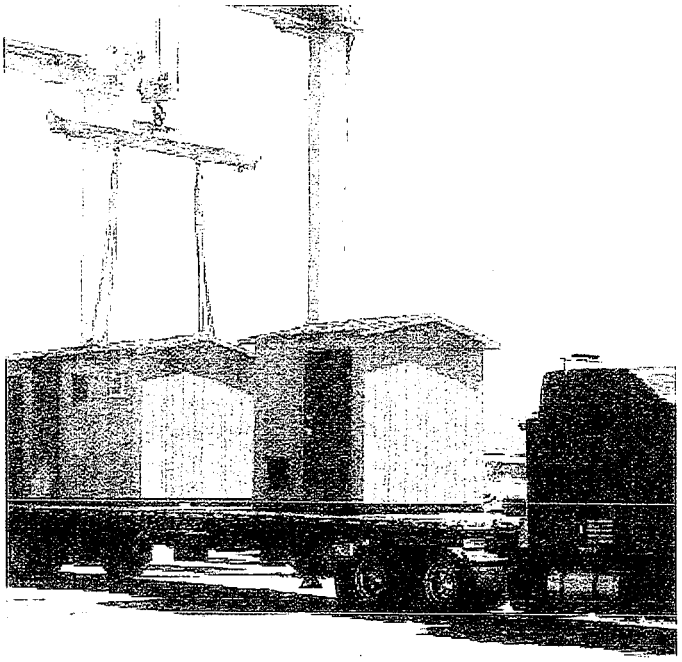
To confirm the validity of this Power of Attorney call 1-610-832-8240 between 9:00 am and 4:30 pm EST on any business day.

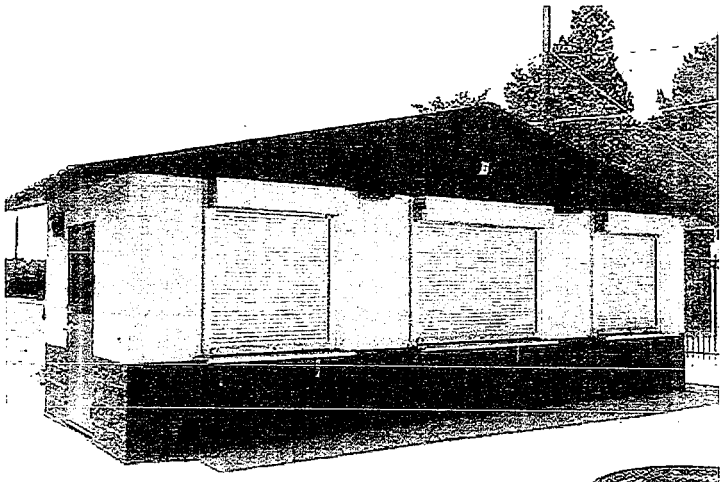
PumpTech inc.

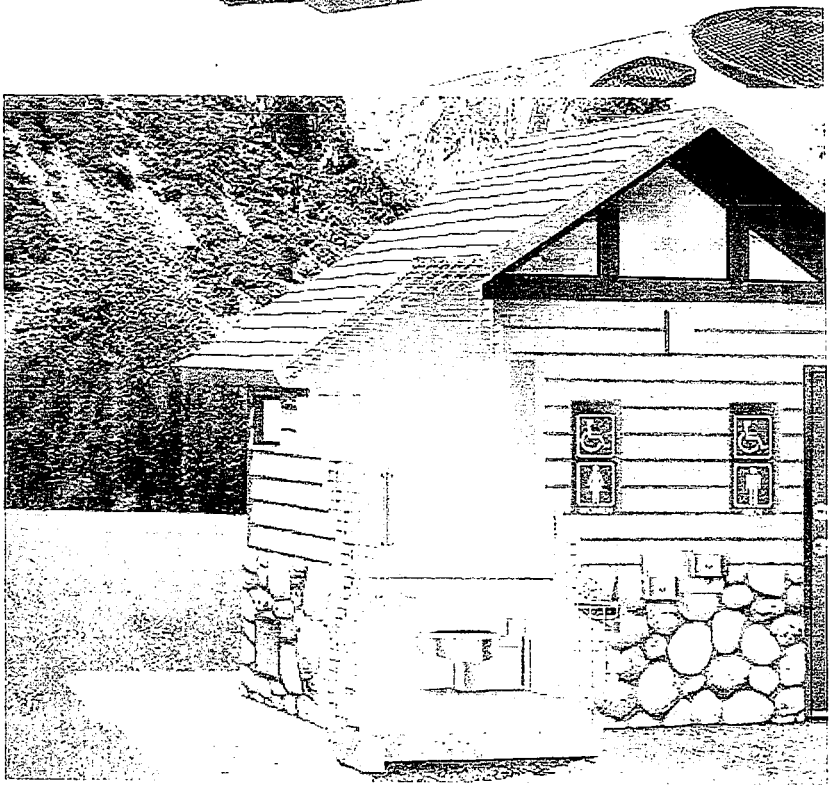
MULTI PURPOSE BUILDINGS

CXT®

www.cxtinc.com
800.696.5766







GRUNDFOS

Grundfos Quotation System 20.2.4

Construction Datasheet

Project name	: Emmett Booster
Consulting engineer	:
Customer	: PUMPTECH INC
Customer ref. / PO	:
Quote Number / ID	: 147549
Date last saved	: 07/22/2020 12:16 PM

Tag Number	: 002
Service	:
Model	: 50157 LC
Quantity	: 2
Quoted By (Sales Office)	: PUMPTECH INC
Quoted By (Sales Engineer)	: Alana Dobner

Nozzle	Size (in.)	Nozzle Configuration	Pos'n
Suction	6	125# ANSI	End
Discharge	5	125# ANSI	Top

Orientation / Configuration	: Horizontal
Rotation	: Clockwise
Wear Ring Configuration	: Single - Case
Discharge Elbow Size	: -
Subplate	: -
Sump Depth (feet)	: -
Bearing Frame	: -
Bearing Frame Foot	: -
Bearing Type (Radial/Thrust)	: In motor
Bearing Lubrication	: -
Thrust Bearing	: -
Intermediate Bearing	: -
Lower Bearing	: -
Bearing Housing Accessories	: -
PACO Construction code	: 10N6-50157-A50008-2922P

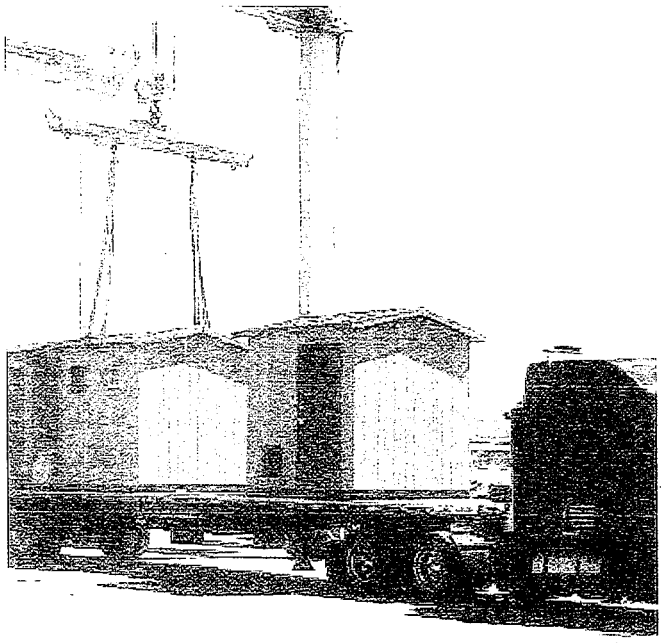
Baseplate	: Not Applicable
Drip Pan	: -
Coupling	: -
Guard	: Not Applicable

Sealing Method	: Single Seal, Type 1
Seal Material	: Buna Carbon Ceramic SS-Spring and Brass Hardware
Packing Gland	: -
Lantern Ring	: -
Recirculation Lines	: None

Pump	: 344.0 lb
Baseplate	: -
Driver	: 934.0 lb
Estimated Shipping gross weight	: 1,278.0 lb

Manufacturer	: Baldor
Frame Size	: 365TCZ
Power	: 75.00 hp
RPM	: 1800 rpm
Enclosure	: TEFC
Operating Power Supply	: 230/460/3/60
Efficiency	: Premium
Service factor	: 1.15
Motor Application	: General Purpose
Motor Options/Accessories	: -
Cord Length (feet)	: -

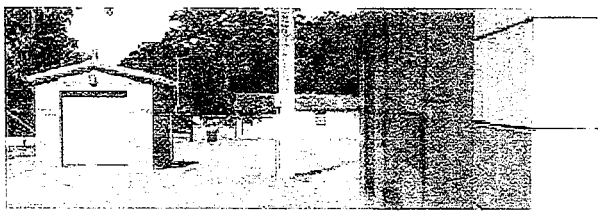
Case	: Cast Iron, ASTM A48 - Class 30
Motor Bracket	: Cast Iron, ASTM-A48, CL 30
Impeller	: Stainless Steel, AISI-304 (H304)
Impeller Cap Screw and Washer	: Anodized Steel
Impeller Key	: Stainless Steel, AISI 316
Case wear ring	: Tin Bronze, ASTM B584-90500 (B18)
Impeller wear ring	: -
Pump Shaft	: Steel, AISI-1040
Sleeve	: Bronze, III932, C89835
Line Shaft	: -
Column	: -
Discharge Pipe	: -
Discharge Elbow	: -
Suction Elbow	: -
Subplate	: -
Hardware	: Steel, Grade 5
O Rings	: Buna N
Pump Coatings	: Standard Manufacturer's Paint



CXT® multi purpose buildings are engineered and designed for long life in extreme conditions. Some uses include storage, utility, office or concession buildings.

- Built to Look Great and Designed to Last
- Simple to Install and Ready to Use
- Easy to Maintain and Vandal Resistant
- Pre-Engineered
- Tougher Than Kits, Block or Steel

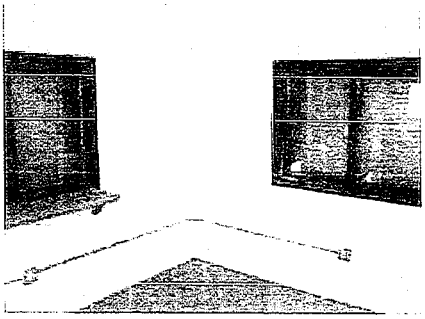
- Barnwood texture walls
- Cedar shake textured roof
- 3068 steel door
- Wall vent



GREEN BUILDINGS

MULTI PURPOSE BUILDINGS

- Pre-wired, pre-plumbed and tested before shipping to meet local code requirements.
- Concealed within the chase/storage area for easy hook up and maintenance, and to reduce vandalism.



- Minimal site work is required.
- Water, sewage and electrical utility lines are stubbed up through the prepared base material to match up with the utility blockout within the floor of the chase area.
- Hookup of the three utility lines can be completed in a matter of hours.

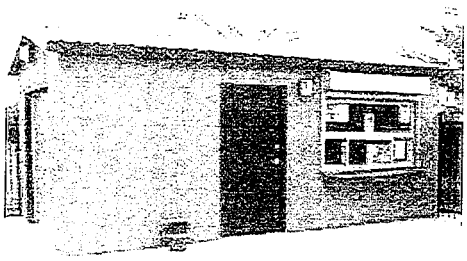
- Meets UFAS, ADA and California Title 24 requirements
- Vandal resistant building and toilet components
- 4" thick steel reinforced concrete walls
- 5" thick steel reinforced concrete roof and floors
- Quick installation and hookup at the job site
- Will not rot, rust or burn
- Easily cleaned with a brush and warm soapy water
- Available in 28 different colors
- Custom textures and colors also available

GSA Schedule

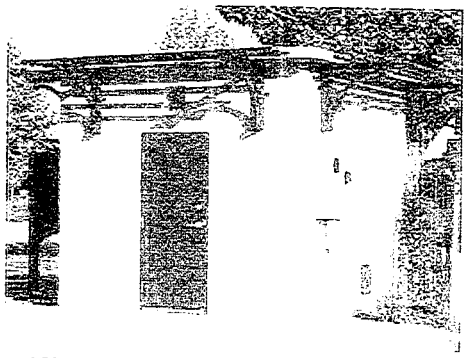
CXT®

www.cxtinc.com

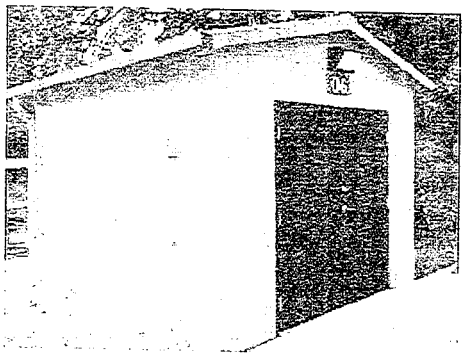
800.696.5766



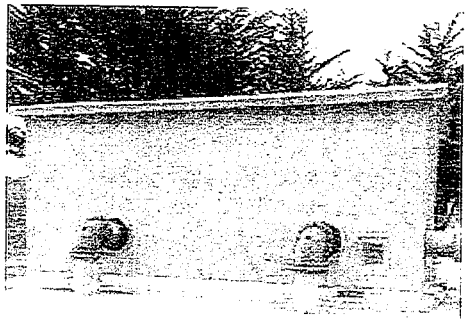
» 10' 6" x 20' storage/concession building
» Salsa Red Stucco walls
» Java Brown Ribbed Metal roof
» Concession window and roll-up door



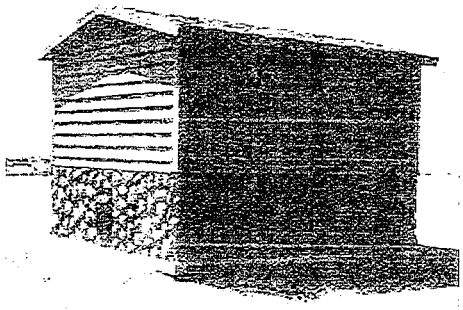
» 12' x 12' restroom/maintenance building with flat roof
» Western Wheat Split Face Block lower and smooth upper walls with Hunter Green accents



» 12' x 12' storage building
» Buckskin Split Face Block walls
» Toasted Almond Cedar Shake roof

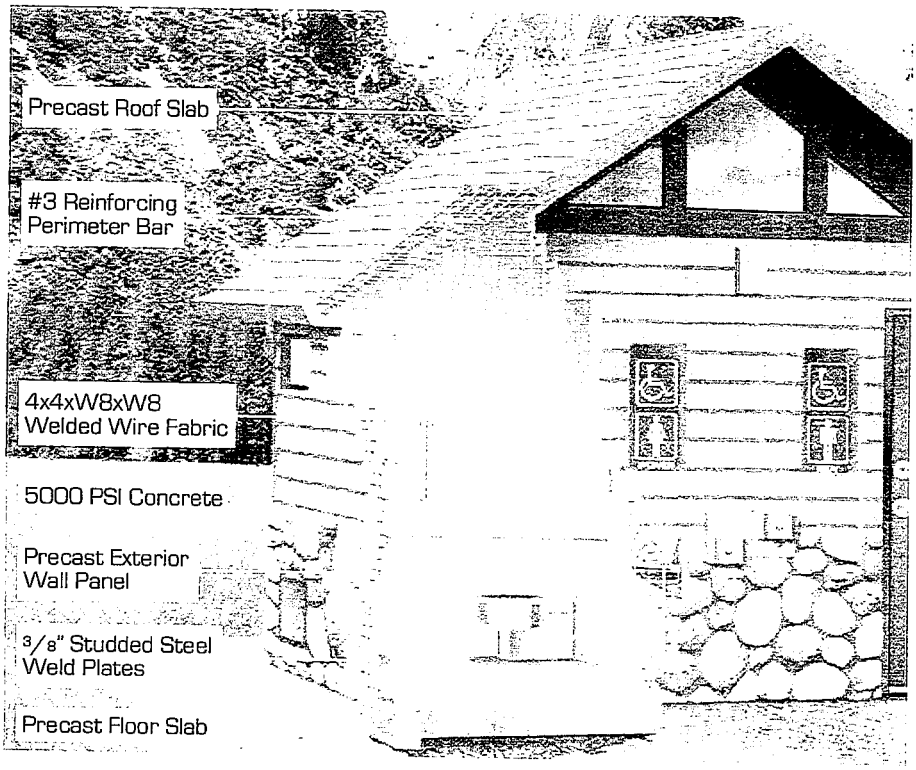


» 10' 6" x 20' pump house building
» Rich Earth Stucco walls
» Java Brown Ribbed Metal roof



» 10' 6" x 12' storage building
» Malibu Taupe Horizontal Lap upper walls and Basalt River Rock lower walls
» Malibu Taupe Cedar Shake roof

ENGINEERED TO WITHSTAND SNOW, WIND, WATER AND ZONE-4 SEISMIC LOADS



CXT®

www.cxtinc.com
800.696.5766

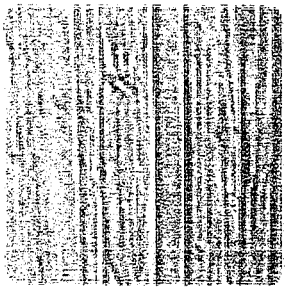
Concrete Buildings

3808 N. Sullivan Road, Building #7
Spokane, WA 99216
Toll Free: 800.696.5766
Phone: 509.921.8766
Fax: 509.928.8270

TEXTURES

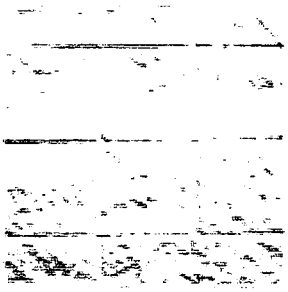
Wall Textures

STANDARD

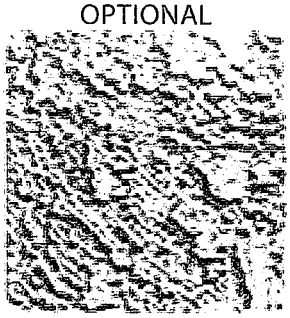


Barnwood

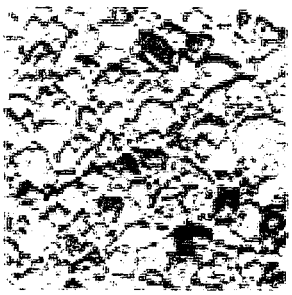
OPTIONAL



Split Face Block

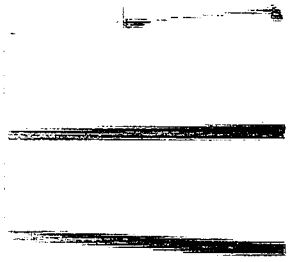


Stucco

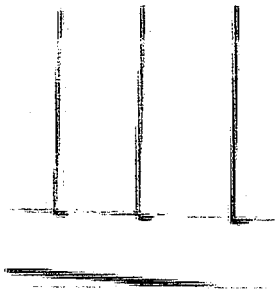


Exposed Aggregate

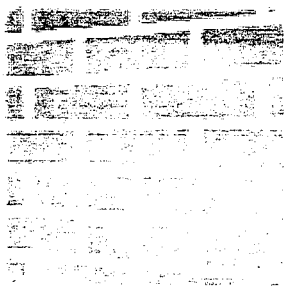
SPECIALITY



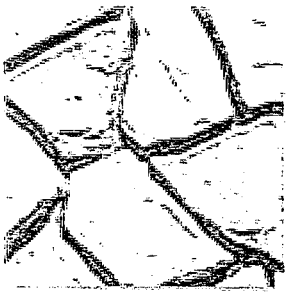
Horizontal Lap Siding



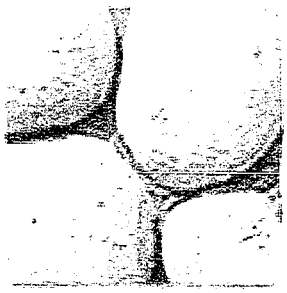
Board & Batt



Brick



Field Stone

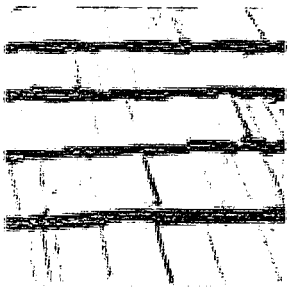


River Rock

Napa Valley

Roof Textures

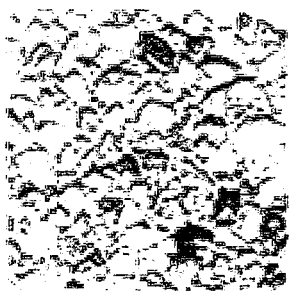
STANDARD



Cedar Shake

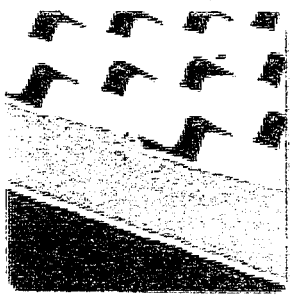
OPTIONAL

Delta



Exposed Aggregate

SPECIALITY



Tile

Concrete Buildings

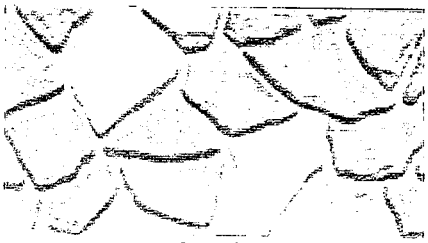
3808 N. Sullivan Road, Building #7
Spokane, WA 99216
Toll Free: 800.696.5766
Phone: 509.921.8766
Fax: 509.928.8270

Color Chart

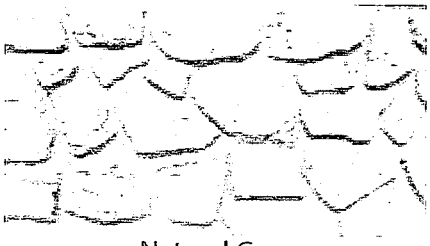
AMBER ROSE	GEORGIA BRICK	SUN BRONZE	SALSA RED	BERRY MAUVE	ROSEWOOD	GOLDEN BEIGE	PUEBLO GOLD
BUCKSKIN	NATURAL HONEY	WESTERN WHEAT	OATMEAL BUFF	RICH EARTH	TOASTED ALMOND	COCA MILK	MOCHA CARMEL
SAND BEIGE	LIBERTY TAN	JAVA BROWN	CAPPUCCION CREAM	MALIBU TAUPE	NUSS BROWN	CHARCOAL GRAY	RAVEN BLACK
SAGE	HUNTER GREEN	EVERGREEN	GRANITE ROCK				

Stone Color Options

Mountain Blend



Basalt



Natural Grey

Ramona

PumpTech Inc.
Project # 147549

CXT Pre-fabricated Concrete Building Site Preparation and Installation Instructions:

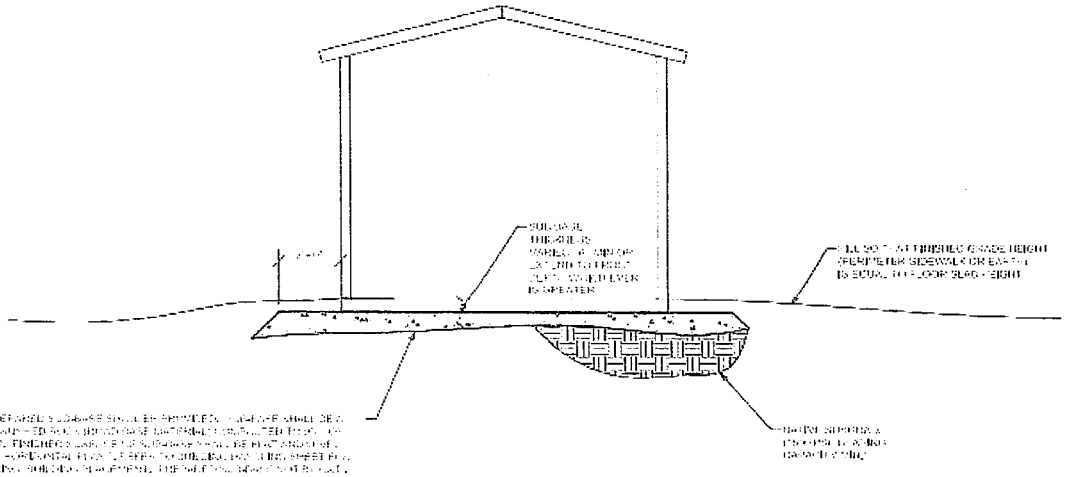
NOTE:

THIS FACTORY ASSEMBLED BUILDING AS CONSTRUCTED PROVIDES A RIGID BOX TYPE STRUCTURAL SYSTEM. VERTICAL LOADS ARE TRANSFERRED PRIMARILY THROUGH BEARING WALLS TO THE STRUCTURAL SLAB FLOOR OF THE BUILDING. THE VERTICAL LOADS ARE THEN DISTRIBUTED TO THE PREPARED GRANULAR NON-FROST SUSCEPTIBLE (NFS) SUB-BASE WHICH DISSIPATES VERTICAL LOADS UNIFORMLY TO THE NATIVE SUB-GRADE AS WITH MOST CONSTRUCTION. THIS DOES REQUIRE THE NATIVE SUB-GRADE TO BE STRIPPED OF VEGETATION AND TOP SOIL PRIOR TO PLACEMENT OF THE PREPARED GRANULAR SUB-BASE. DUE TO THE INHERENT STIFFNESS OF THE BUILDING, IT WILL REMAIN SAFE AND STRUCTURALLY SOUND IN THE UNLIKELY EVENT OF FREEZING ACTION BELOW THE BUILDING REGARDLESS OF NATURAL FREEZE THAW CYCLES ANTICIPATED TO BE ENCOUNTERED.

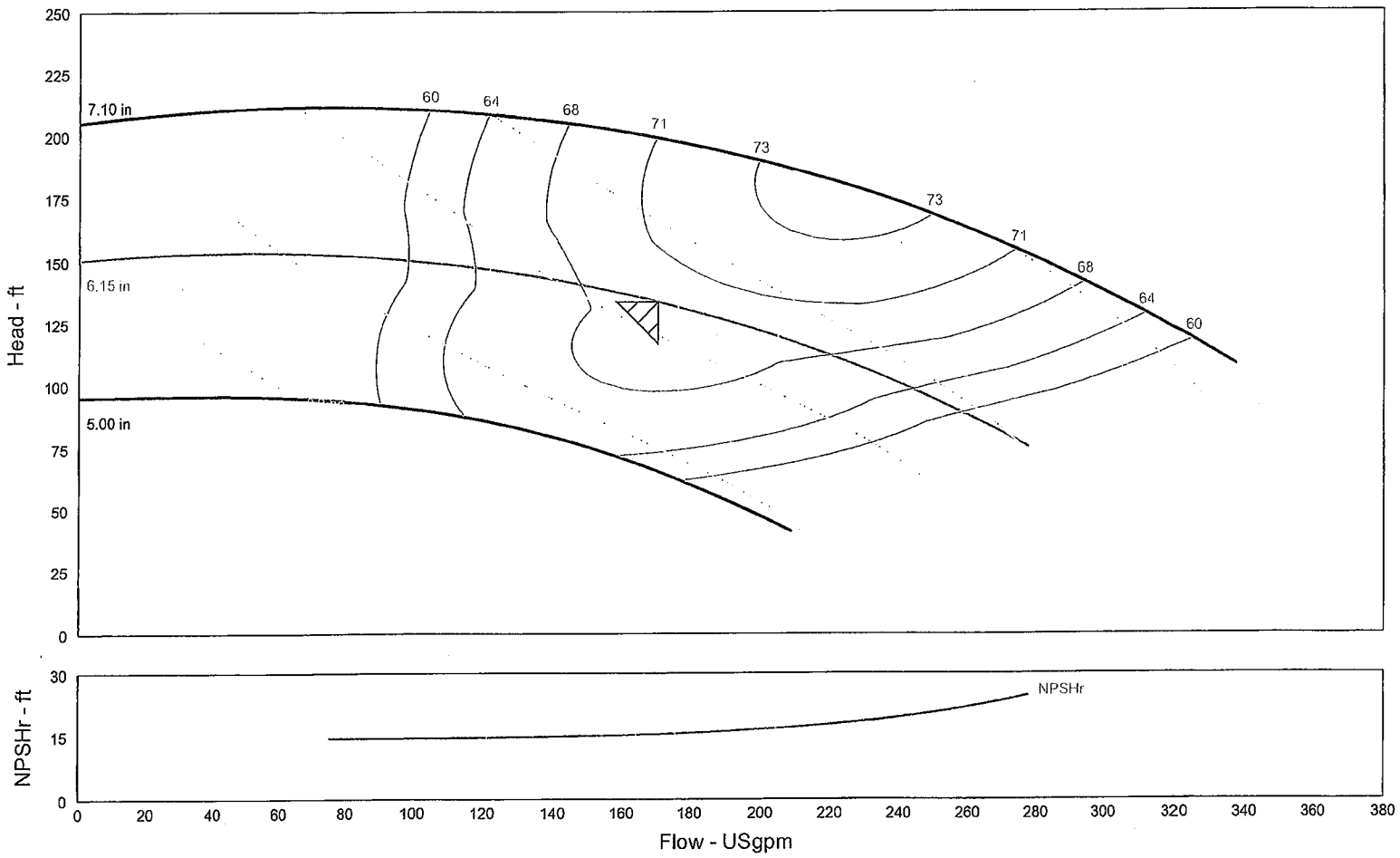
LATERAL LOADS ARE TRANSFERRED TO THE GROUND THROUGH FRICTIONAL RESISTANCE WITHOUT SLIDING OR SHIFTING BETWEEN THE BUILDING FLOOR SLAB AND THE PREPARED SOIL AND GRAVEL SUB-BASE ON WHICH THE BUILDING RESTS. SEISMIC ANALYSES ARE BASED ON LOADS DETERMINED IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE USING PARAMETERS WHICH MEET OR EXCEED THE CODE PRESCRIBED REQUIREMENTS FOR THIS INSTALLATION.

THIS BUILDING, AS DESIGNED, RESTING ON A PROPERLY PREPARED GRANULAR SUB-BASE WILL BE SAFE AND STRUCTURALLY SOUND FOR VERTICAL AND LATERAL LOADS AS DISCUSSED ABOVE. A FULL DEPTH FOUNDATION WALL AT THE BUILDING PERIMETER, TYPICAL FOR OTHER TYPES OF BUILDING CONSTRUCTION, IS NOT REQUIRED FOR THIS BUILDING.

THE "FOUNDATION" FOR THIS STRUCTURE IS ESSENTIALLY THE COMBINATION OF THE COMPACTED SUB-BASE MATERIAL AND THE BUILDING'S REINFORCED SLAB. THE COMBINATION OF THE COMPACTED SUB-BASE MATERIAL AND THE BUILDING'S REINFORCED SLAB NEED TO BE AT LEAST 12" THICK AND THE COMPACTED SUB-BASE MATERIAL SHALL EXTEND BELOW THE LOCAL FROST DEPTH.



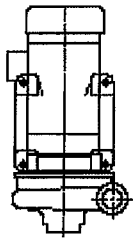
Pump Performance Curve



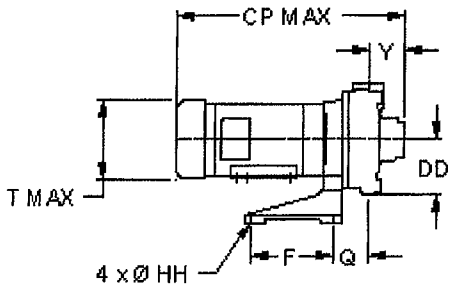
Project name	: Emmett Booster	Tag Number	: 001	Flow, rated	: 170.0 USgpm
Consulting engineer	:	Service	:	Differential head / pressure, rated	: 134.0 ft
Customer	:	Model	: 15705 LC	Rated power (based on duty point)	: 8.28 hp
Customer ref. / PO	:	Quantity	: 2	Max power (non-overloading)	: 10.12 hp
Quote Number / ID	: 147549	Quoted By (Sales Office)	: PUMPTECH INC	Efficiency	: 69.47 %
Date last saved	: 07/22/2020 12:14 PM	Quoted By (Sales Engineer)	: Alana Dobner	Impeller diameter, rated	: 6.15 in
Based on curve number	: RC2188-SS Rev 0	Stages	: 1	PEI (CL)	: 0.89
		Speed, rated	: 3530 rpm	ER (CL)	: 11

General Arrangement

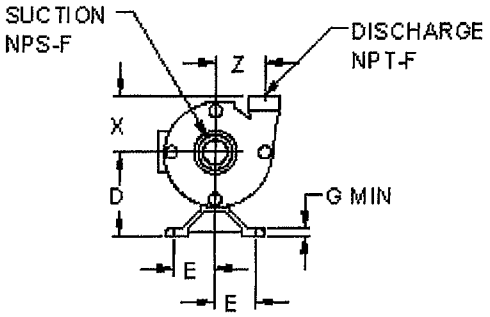
Project name	: Emmett Booster	Tag Number	: 001
Consulting engineer	:	Service	:
Customer	: PUMPTECH INC	Model	: 15705 LC
Customer ref. / PO	:	Quantity of pumps	: 2
Quote Number / ID	: 147549	Quoted By (Sales Office)	: PUMPTECH INC
Date last saved	: 07/22/2020 12:14 PM	Quoted By (Sales Engineer)	: Alana Dobner



PLAN



SIDE VIEW



END VIEW

NOT FOR CONSTRUCTION, Unless certified and referenced on order

Units	Frame	Suct(in)	Disch(in)	CP	D	DD	E	F	G	HH	Q	T	X	Y	Z	Weight ea
inches	**254JMZ**	**2**	**1.5**	**28.00**	**7.50**	**5.00**	**3.75**	**7.50**	**0.63**	**0.44**	**3.06**	**11.50**	**5.13**	**3.13**	**4.38**	**330.0**

Conditions of Service		**Motor Data**			
Flow: 170.0 USgpm	Fluid: Cold Water	HP: 15	Encl: TEFC	Phase: 3	Efficiency: Premium
TDH: 134.0 ft	Temp.: 68.00 deg F	RPM: 3530 rpm	Hz: 60	Voltage: 230/460	S.F.: 1.15

GRUNDFOS

Grundfos Quotation System 20.2.4

Construction Datasheet

Project name	: Emmett Booster
Consulting engineer	:
Customer	: PUMPTECH INC
Customer ref. / PO	:
Quote Number / ID	: 147549
Date last saved	: 07/22/2020 12:14 PM

Tag Number	: 001
Service	:
Model	: 15705 LC
Quantity	: 2
Quoted By (Sales Office)	: PUMPTECH INC
Quoted By (Sales Engineer)	: Alana Dobner

Nozzle	Size (in.)	Nozzle Configuration	Pos'n
Suction	2	NPS	End
Discharge	1.5	NPS	Top

Orientation / Configuration	: Horizontal
Rotation	: Clockwise
Wear Ring Configuration	: Single - Case
Discharge Elbow Size	: -
Subplate	: -
Sump Depth (feet)	: -
Bearing Frame	: -
Bearing Frame Foot	: -
Bearing Type (Radial/Thrust)	: In motor
Bearing Lubrication	: -
Thrust Bearing	: -
Intermediate Bearing	: -
Lower Bearing	: -
Bearing Housing Accessories	: -
PACO Construction code	: 10N6-15705-A30008-2821P

Baseplate	: Not Applicable
Drip Pan	: -
Coupling	: -
Guard	: Not Applicable

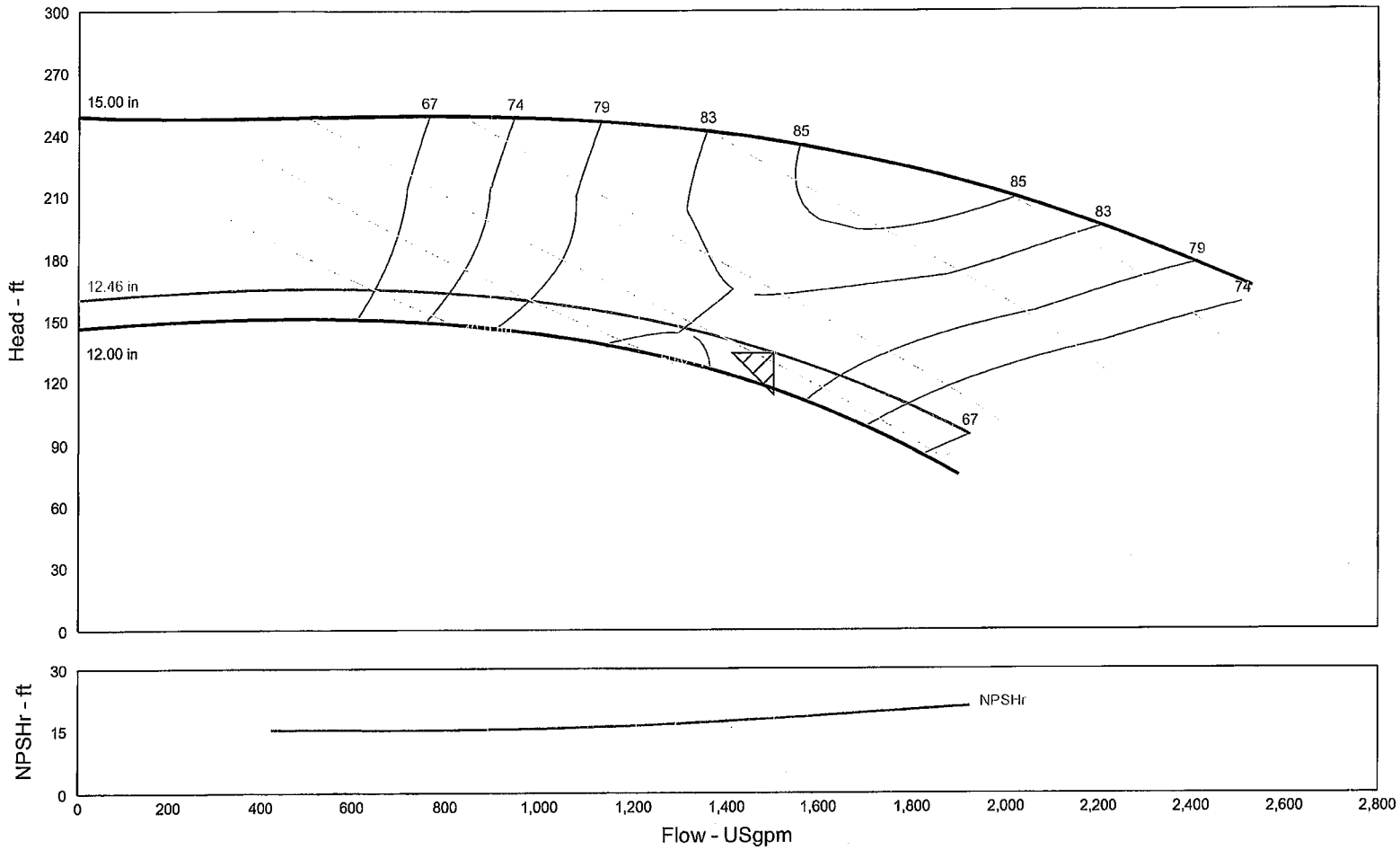
Sealing Method	: Single Seal, Type 1
Seal Material	: Buna Carbon Ceramic SS-Spring and Brass Hardware
Packing Gland	: -
Lantern Ring	: -
Recirculation Lines	: None

Pump	: 50.00 lb
Baseplate	: -
Driver	: 280.0 lb
Estimated Shipping gross weight	: 330.0 lb

Manufacturer	: Baldor
Frame Size	: 254JMZ
Power	: 15.00 hp
RPM	: 3600 rpm
Enclosure	: TEFC
Operating Power Supply	: 230/460/3/60
Efficiency	: Premium
Service factor	: 1.15
Motor Application	: General Purpose
Motor Options/Accessories	: -
Cord Length (feet)	: -

Case	: Cast Iron, ASTM A48 - Class 30
Motor Bracket	: Cast Iron, ASTM-A48, CL 30
Impeller	: Stainless Steel, AISI-304 (H304)
Impeller Cap Screw and Washer	: Stainless Steel, AISI-303
Impeller Key	: Stainless Steel, AISI 316
Case wear ring	: Tin Bronze, ASTM B584-90500 (B18)
Impeller wear ring	: -
Pump Shaft	: Steel, AISI-1040
Sleeve	: Bronze, III932, C89835
Line Shaft	: -
Column	: -
Discharge Pipe	: -
Discharge Elbow	: -
Suction Elbow	: -
Subplate	: -
Hardware	: Steel, Grade 5
O Rings	: Buna N
Pump Coatings	: Standard Manufacturer's Paint

Pump Performance Curve



Project name	: Emmett Booster	Tag Number	: 002	Flow, rated	: 1,500.0 USgpm
Consulting engineer	:	Service	:	Differential head / pressure, rated	: 134.0 ft
Customer	:	Model	: 50157 LC	Rated power (based on duty point)	: 61.99 hp
Customer ref. / PO	:	Quantity	: 2	Max power (non-overloading)	: 68.17 hp
Quote Number / ID	: 147549	Quoted By (Sales Office)	: PUMPTECH INC	Efficiency	: 81.82 %
Date last saved	: 07/22/2020 12:16 PM	Quoted By (Sales Engineer)	: Alana Dobner	Impeller diameter, rated	: 12.46 in
Based on curve number	: RC2113-SS Rev 0	Stages	: 1	PEI (CL)	: 0.95
		Speed, rated	: 1780 rpm	ER (CL)	: 5

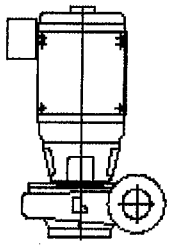
PumpTech, Inc. · 12020 SE 32nd Street · Suite 2 · Bellevue, WA 98005
phone: 425-644-8501 · fax: 425-562-9213 · www.pumptechnw.com

GRUNDFOS

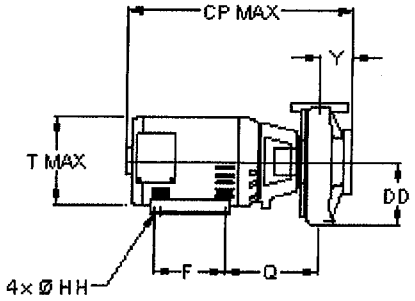
Grundfos Quotation System 20.2.4

General Arrangement

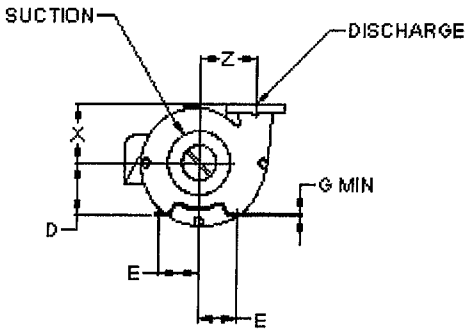
Project name	: Emmett Booster	Tag Number	: 002
Consulting engineer	:	Service	:
Customer	: PUMPTECH INC	Model	: 50157 LC
Customer ref. / PO	:	Quantity of pumps	: 2
Quote Number / ID	: 147549	Quoted By (Sales Office)	: PUMPTECH INC
Date last saved	: 07/22/2020 12:16 PM	Quoted By (Sales Engineer)	: Alana Dobner



PLAN



SIDE VIEW



END VIEW

NOT FOR CONSTRUCTION, Unless certified and referenced on order

Units	Frame	Suct(in)	Disch(in)	CP	D	DD	E	F	G	HH	Q	T	X	Y	Z	Weight ea
inches	**365TCZ**	**6**	**5**	**45.00**	**9.00**	**11.00**	**7.00**	**12.25**	**1.00**	**0.66**	**16.63**	**18.25**	**10.00**	**5.75**	**9.88**	**1,278.0**

Conditions of Service		**Motor Data**			
Flow: 1,500.0 USgpm	Fluid: Cold Water	HP: 75	Encl: TEFC	Phase: 3	Efficiency: Premium
TDH: 134.0 ft	Temp.: 68.00 deg F	RPM: 1780 rpm	Hz: 60	Voltage: 230/460	S.F.: 1.15

PumpTech, Inc. · 12020 SE 32nd Street · Suite 2 · Bellevue, WA 98005
phone: 425-644-8501 · fax: 425-562-9213 · www.pumptechnw.com

GRUNDFOS

Grundfos Quotation System 20.2.4

Construction Datasheet

Project name	: Emmett Booster
Consulting engineer	:
Customer	: PUMPTECH INC
Customer ref. / PO	:
Quote Number / ID	: 147549
Date last saved	: 07/22/2020 12:16 PM

Tag Number	: 002
Service	:
Model	: 50157 LC
Quantity	: 2
Quoted By (Sales Office)	: PUMPTECH INC
Quoted By (Sales Engineer)	: Alana Dobner

Nozzle	Size (in.)	Nozzle Configuration	Pos'n
Suction	6	125# ANSI	End
Discharge	5	125# ANSI	Top

Orientation / Configuration	: Horizontal
Rotation	: Clockwise
Wear Ring Configuration	: Single - Case
Discharge Elbow Size	: -
Subplate	: -
Sump Depth (feet)	: -
Bearing Frame	: -
Bearing Frame Foot	: -
Bearing Type (Radial/Thrust)	: In motor
Bearing Lubrication	: -
Thrust Bearing	: -
Intermediate Bearing	: -
Lower Bearing	: -
Bearing Housing Accessories	: -
PACO Construction code	: 10N6-50157-A50008-2922P

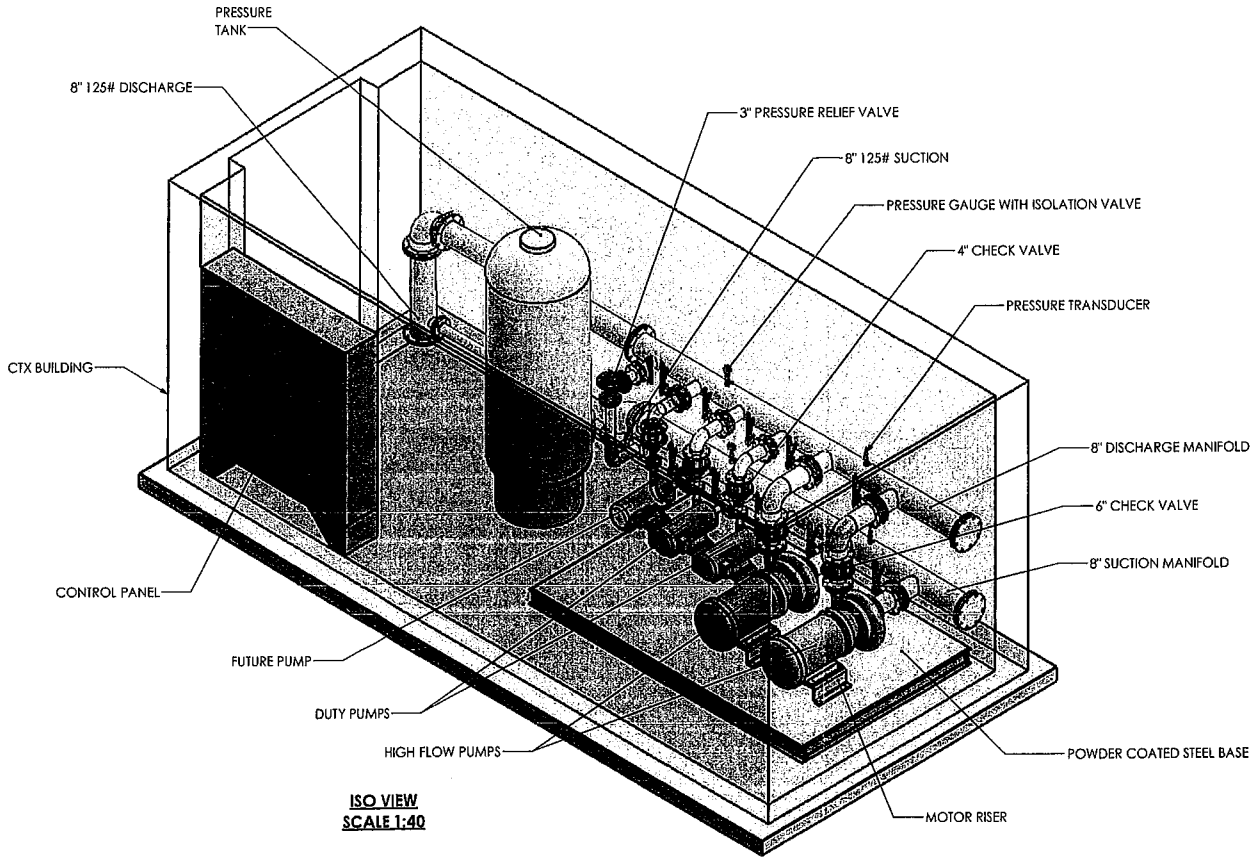
Baseplate	: Not Applicable
Drip Pan	: -
Coupling	: -
Guard	: Not Applicable

Sealing Method	: Single Seal, Type 1
Seal Material	: Buna Carbon Ceramic SS-Spring and Brass Hardware
Packing Gland	: -
Lantern Ring	: -
Recirculation Lines	: None

Pump	: 344.0 lb
Baseplate	: -
Driver	: 934.0 lb
Estimated Shipping gross weight	: 1,278.0 lb

Manufacturer	: Baldor
Frame Size	: 365TCZ
Power	: 75.00 hp
RPM	: 1800 rpm
Enclosure	: TEFC
Operating Power Supply	: 230/460/3/60
Efficiency	: Premium
Service factor	: 1.15
Motor Application	: General Purpose
Motor Options/Accessories	: -
Cord Length (feet)	: -

Case	: Cast Iron, ASTM A48 - Class 30
Motor Bracket	: Cast Iron, ASTM-A48, CL 30
Impeller	: Stainless Steel, AISI-304 (H304)
Impeller Cap Screw and Washer	: Anodized Steel
Impeller Key	: Stainless Steel, AISI 316
Case wear ring	: Tin Bronze, ASTM B584-90500 (B18)
Impeller wear ring	: -
Pump Shaft	: Steel, AISI-1040
Sleeve	: Bronze, III932, C89835
Line Shaft	: -
Column	: -
Discharge Pipe	: -
Discharge Elbow	: -
Suction Elbow	: -
Subplate	: -
Hardware	: Steel, Grade 5
O Rings	: Buna N
Pump Coatings	: Standard Manufacturer's Paint



ISO VIEW
SCALE 1:40

STATUS: PRELIMINARY

USED ON: -

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL: +/- 1/8
ANGULAR: +/- 1
ONE PLACE DECIMAL +/- 0.5
TWO PLACE DECIMAL +/- 0.07

INTERPRET GEOMETRIC TOLERANCING PER:
MATERIAL -
FINISH -
DO NOT SCALE DRAWING

	NAME	INIT.	DATE
DRAWN	WES		7/21/20
CHECKED	AAB		-
SALES PERSON	RC		-
PURCH APPR	JB		-
MFG APPR	KL		-

PumpTech INC.

S.O.#147549 M.T.S.#-

KELLER

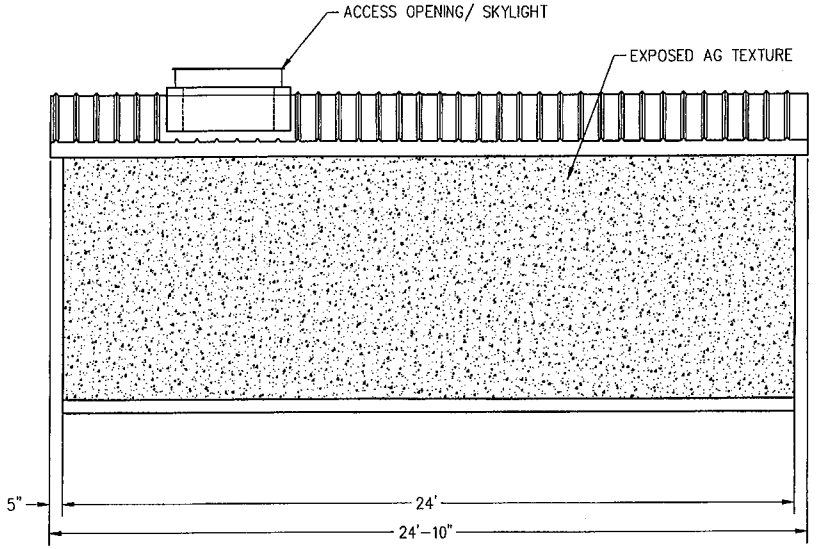
CITY OF EMMETT BOOSTER STATION

GENERAL ARRANGEMENT

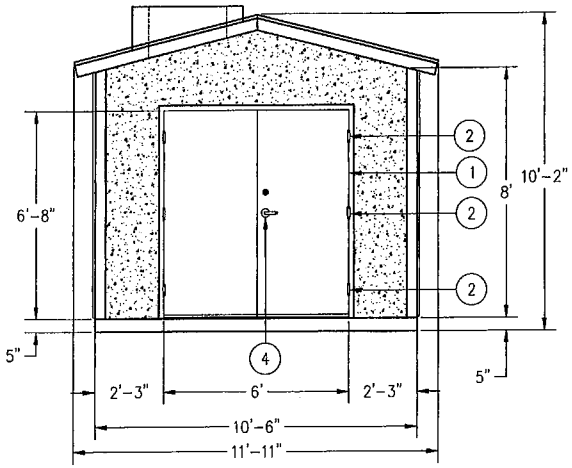
SIZE B DWG. NO. M04968 REV -

SCALE: A/S WT: - SHEET 2 OF 2

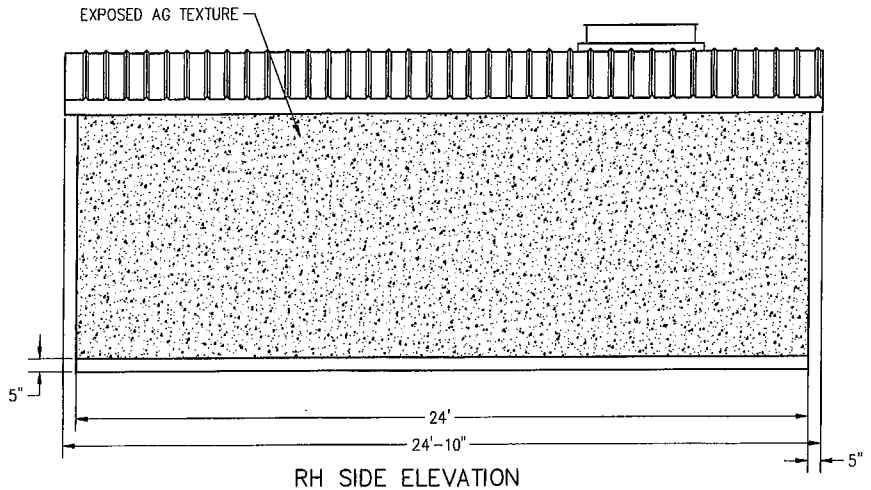
PRINT DATE: 7/22/2020 11:22 AM



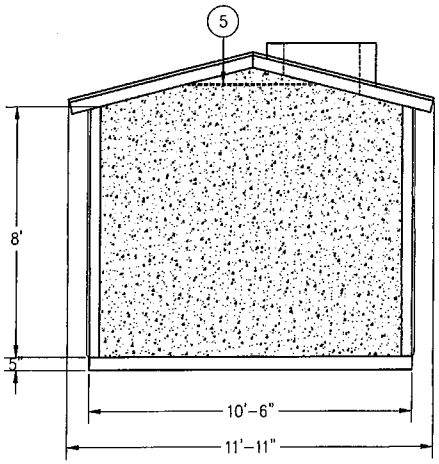
LH SIDE ELEVATION



FRONT ELEVATION



RH SIDE ELEVATION



BACK ELEVATION

		BILL OF MATERIALS
ITEM	QTY	DESCRIPTION
1	1	6068 RH ACTIVE DOOR ASSEMBLY
		PREP FOR DEAD BOLT
		OPENS OUT
		AUTOMATIC DOOR BTM
		6' THRESHOLD
		FLUSH MOUNT BOLT
		ASTRAGAL
2	6	SPRING HINGE 4.5 x 4.5
3	1	SCHALAGE DEAD BOLT LOCK
4	1	CLASS ROOM LEVER
5	3	FLAT BAR 1/2" x 5HR x 4'-2"
		APPROXIMATE WEIGHT

Precast Products

PROJECT TITLE

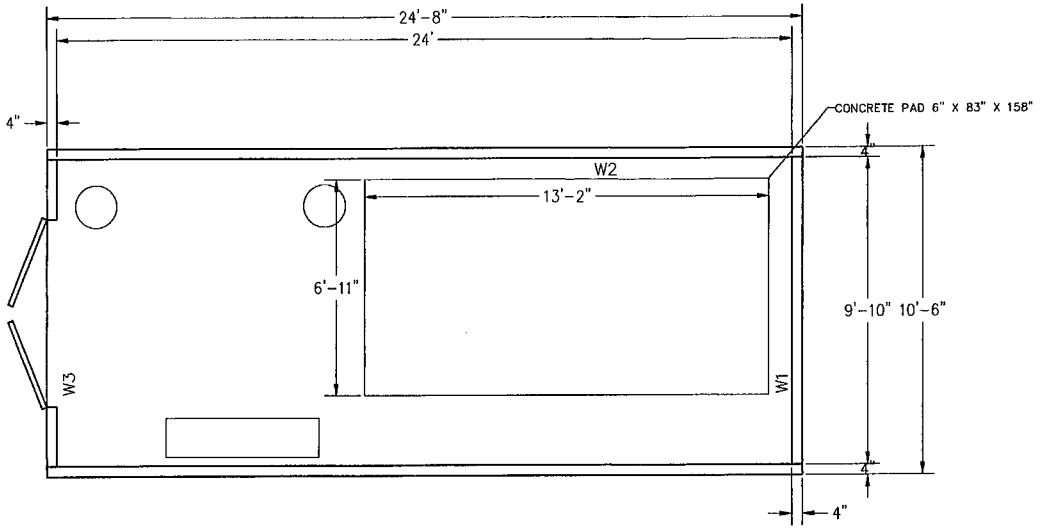
10'-6" x 24'-8" SCHWEITZER

20-055P

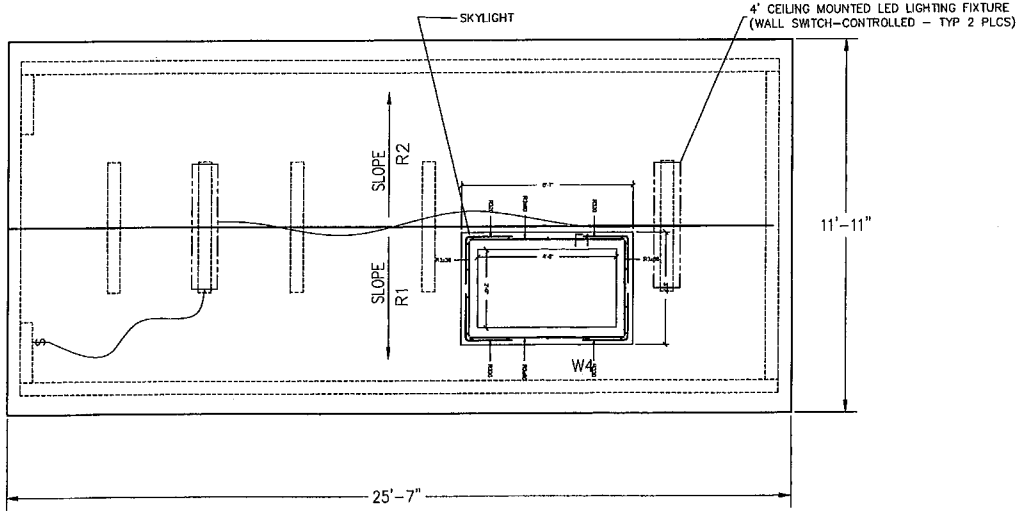
REV.	DESCRIPTION	APPROVAL	DATE
SCALE	1/4"=1'-0"	DATE	7/21/20
DRAWN	M. TOLMAN	FILE NO.	20-055P
CHECKED		PLOT	48

BUILDING ELEVATIONS

DWG NO.	SHEET	REV.
10.524-02	2 / 17	



FLOOR PLAN



ROOF PLAN

Precast Products

PROJECT TITLE

10'-6" x 24'-8" SCHWEITZER

20-055P

NOTICE

REV.	DESCRIPTION	APPROVAL	DATE

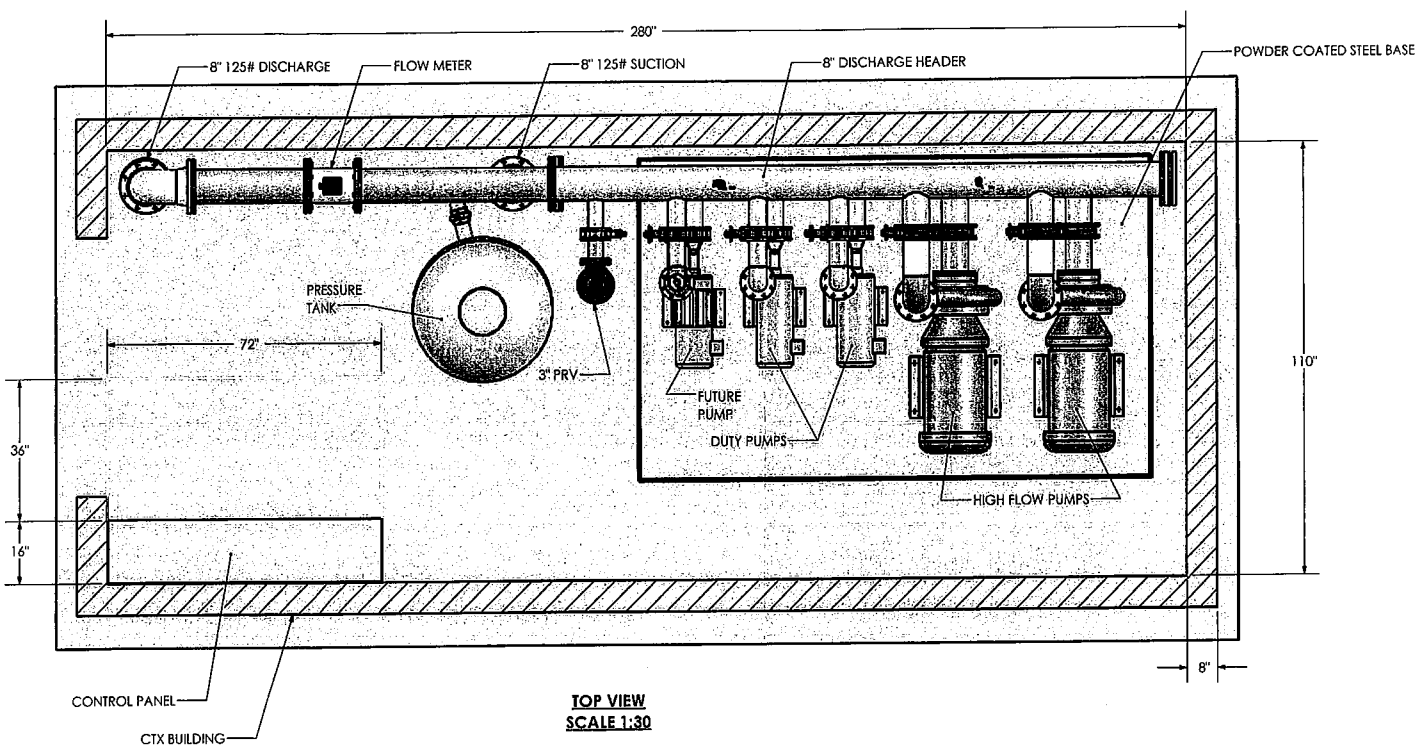
SCALE	1/4"=1'-0"	DATE	7/20/20
DRAWN	M. TOLMAN	FILE NO.	20-055P
CHECKED	MCT	PLOT	48

PLAN VIEW

DWG NO.	SHEET	REV.
10.524-03	3 / 17	

PRESSURE	80 PSI
FLOW	0-1840 GPM

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED



TOP VIEW
SCALE 1:30

NOTES:
1. ALL PIPING 316SS.
2. POWDER COATED STEEL BASE.
3. HEADER SUPPORTS NOT SHOWN.

STATUS: PRELIMINARY

USED ON: -

UNLESS OTHERWISE SPECIFIED:		NAME	INIT.	DATE
DIMENSIONS ARE IN INCHES	DRAWN	WES		7/21/20
TOLERANCES:				
FRACTIONAL: +/- 1/8	CHECKED	AAB		-
ANGULAR: +/- 1				
ONE PLACE DECIMAL +/- 0.5	SALES PERSON	RC		-
TWO PLACE DECIMAL +/- 0.07	PURCH APPR	JB		-
INTERPRET GEOMETRIC TOLERANCING PER:	MFG APPR	KL		-
MATERIAL -				
FINISH -				
DO NOT SCALE DRAWING				

PumpTech INC.

S.O.#147549 M.T.S.#-

KELLER

CITY OF EMMETT BOOSTER STATION

GENERAL ARRANGEMENT

SIZE B DWG. NO. M04968 REV -

SCALE: A/S WT: - SHEET 1 OF 2

PRINT DATE: 7/22/2020 11:13 AM

BID FORM

PROJECT IDENTIFICATION: City of Emmett

12th Street Booster Station

CONTRACT IDENTIFICATION NUMBER:

1.01 This Bid is submitted to: **City of Emmett**

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into a Contract with Buyer in the form included in the Bidding Documents to furnish the Goods and Special Services as specified or indicated in the Bidding Documents, for the prices and within the times indicated in this Bid, and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 - BIDDER'S ACKNOWLEDGMENTS

2.01 Bidder accepts all of the terms and conditions of the Notice Inviting Bids and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 45 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Buyer.

2.02 Bidder acknowledges that this Contract, if awarded, may be assigned by the Owner to the Installing Contractor, and hereby consents to the assignment under the terms and conditions of the Pre-Purchase Documents.

ARTICLE 3 - BIDDER'S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, the related data identified in the Bidding Documents, and the following Addenda, receipt of which is hereby acknowledged:

Addendum Date	Addendum Number	Initials
July 17, 2020	Addendum 1	

B. Bidder has visited the Point of Destination and site where the Goods are to be installed or Special Services will be provided and become familiar with and is satisfied as to the observable local conditions that may affect cost, progress, or the furnishing of Goods and Special Services, if required to do so by the Bidding Documents, or if, in Bidder's judgment, any local condition may affect cost, progress, or the furnishing of Goods and Special Services.

ARTICLE 5 - BASIS OF BID

5.01 Bidder will furnish the Goods and Special Services in accordance with the Contract Documents for the following price(s). Vendors may provide bids for one or more of the following base bid items. State of Idaho taxes shall not be included (Section 00800 – Supplementary Conditions 5.05.A).

1	**PACKAGED BOOSTER STATION** consisting of the following:

A. EQUIPMENT: The Vendor shall provide one (1) domestic water packaged booster station meeting the requirements of these contract documents including specification 22 11 23.13 (some components are specified in other sections). It shall include a variable speed packaged pumping system, pressure tank, control panel, and all associated piping, valves, electrical and control wiring and instrumentation required for a complete and operable system.

B. SPECIAL SERVICES - STARTUP AND TRAINING: As defined in Section 01 43 33 and Section 01 75 16.

Bid Item	Approximate Quantity	Unit	Bid Price	Amount Bid
Packaged Booster Station Price[1]	1	LS	$ 353,680.00	$ 353,680.00
Booster Station Foundation Cash Allowance[2]	1	LS	$5,000	$ 5,000.00
Lump Sum – Packaged Booster Station Bid Price[3]			$ 358,680.00 (Amount in Figures)	

Three hundred fifty eight thousand six hundred eighty dollars.

(Amount in Words)

(Amount shall be shown in both words and figures. In case of discrepancy, the amount shown in words shall govern.)

Notes:
1. This is the contract amount that will be included in the agreement and assigned to an Installation Contractor, if desired by the Owner.
2. Booster Station Foundation Cash Allowance to be included if required by building manufacturer. Cost included is cost for Owner to install foundation for building at job site.
3. This is the bid amount that will be used by the Owner for comparison purposes to award the Packaged Booster Station.

2	**GENERATOR** consisting of the following:
A. EQUIPMENT: The Vendor shall provide one (1) diesel-driven standby power generator, meeting the requirements of these contract documents including specification 26 32 13 and 26 36 00. It shall include generator engine starting systems including batteries, instrument control panel, transfer switches, annunciator panel, exhaust silencer, and accessories required for a complete generator installation	
B. SPECIAL SERVICES - STARTUP AND TRAINING: As defined in Section 01 43 33 and Section 01 75 16.	
Lump Sum Bid Price for Generator and associated components. (This is the contract amount that will be included in the agreement and assigned to an Installation Contractor, if desired by the Owner)	$ 75,700.00 (Amount in Figures) Seventy five thousand, seven hundred dollars. (Amount in Words) (Amount shall be shown in both words and figures. In case of discrepancy, the amount shown in words shall govern.)

ARTICLE 6 - TIME OF COMPLETION

6.01 Bidder agrees that the furnishing of Goods and Special Services will conform to the schedule set forth in Article 5 of the Agreement.

6.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 7 - ATTACHMENTS TO THIS BID

7.01 The following documents are attached to and made a condition of this Bid:

A. Required Bid security (if using bid bond, use form included in bid package);

B. Building floor plan and elevations of all four sides of the building;

C. Mechanical plan (plan view and side view(s)); and

D. Proposed materials for booster station including, building material/supplier, duty pump manufacturer, high flow pump manufacturer, controls component manufacturer, weight of facility, and recommended building installation instructions.

ARTICLE 8 - DEFINED TERMS

8.01 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 9 - BID SUBMITTAL

9.01 This Bid submitted by:

If Bidder is:

An Individual

Name (typed or printed): Not Used

By: _____

(Individual's signature)

Doing business as: _____

Business address: _____

_____

Phone: _____ Facsimile: _____

E-mail address: _____ _____

A Partnership

Partnership Name: Not Used

(SEAL)

By: _____

(Signature of general partner - attach evidence of authority to sign)

Name (typed or printed): _____

Business address: _____

_____

Phone: _____ Facsimile: _____

E-mail address: _____

A Corporation

Corporation Name: Patterson Pump Company

State of Incorporation: Ohio

Type (General Business, Professional, Service, other): General Business

By: _____

(Signature - attach evidence of authority to sign)

Name (typed or printed): Mellissa Lynch

Title: VP, Contracts Compliance

(CORPORATE SEAL)

Attest _____

(Signature of ~~Corporate Secretary~~) President)

Business address: 2129 Ayersville Road

Toccoa, GA 30577

Phone: 706-297-2838 Facsimile: N/A

E-mail address: mel.lynch@pattersonpumps.com

A Limited Liability Company (LLC)

LLC Name: Not Used

State in which organized: _____

By: _____

(Signature - attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Business address: _____

_____

Phone: _____ Facsimile: _____

E-mail address: _____

A Joint Venture

First Joint Venturer Name: Not Used

(SEAL)

By: _____

(Signature - attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Business address: _____

_____

Phone: _____ Facsimile: _____

E-mail address: _____

Second Joint Venturer Name: Not Used

(SEAL)

By: _____

(Signature - attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Business address: _____

_____

Phone: _____ Facsimile: _____

E-mail address: _____

Phone and Facsimile Number, and Address for receipt of official communications to Joint Venture: _____

_____

(Each joint venturer must sign. The manner of signing for each individual, partnership, corporation, and limited liability company that is a party to the joint venture should be in the manner indicated above.)

RECORD OF PROCEEDINGS

Minutes of **Patterson Pump Company** *Meeting*

Held At Toccoa, Georgia **Apr. 16 2020**

Organizational Meeting

Directors Present: Jeff Gorman, Scott King and Kerby Pope
Directors Absent: None

Others in Attendance: Rodney Moore, Jim Kerr, Albert Huber, Robert Kirkendall, Thomas Del Campo and Joe Ferguson

Mr. Jeffery S. Gorman presided as Chairman
Rodney Moore was appointed as Secretary for the meeting

Upon a motion duly made and seconded, the following were elected as officers of the Company for 2020.

Jeffrey Gorman – Chairman
Kerby Pope – President and General Manager
Scott King – Vice President
Rodney Moore – Vice President, Secretary and Treasurer
James Kerr – Assistant Secretary and Assistant Treasurer
Mellissa Lynch – Vice President Contract Compliance

Michael Murazzi- Vice President Morrison Pump Sales
Jorge Cortez- Vice President Morrison Pump Sales

E. Jackson Claxton – Vice President Engineering

Upon a motion duly made and seconded, the following resolution was executed:

Resolved the two named Vice President Morrison Pump Sales shall be granted the privilege of Official Signatory for Patterson Pump Company d/b/a Morrison Pump solely in that capacity.

Resolved the Vice President of Engineering does not hold signatory authority to bind the Corporation in such officer capacity unless authorized by subsequent resolution of the Board of Directors.

There being no further business to come before the Board, upon a motion duly made and seconded, the meeting was adjourned.

Rodney O. Moore, Secretary/ Treasurer

CITY OF EMMETT
12TH STREET BOOSTER STATION 210022-059

BID BOND (Penal Sum Form)

Any singular reference to Bidder, Surety, Owner or other party shall be considered plural where applicable.

BIDDER *(Name and Address)*:
Patterson Pump Company
2129 Ayersville Road
Toccoa, GA 30577

SURETY *(Name, and Address of Principal Place of Business)*:
Western Surety Company
151 N. Franklin St
Chicago, IL 60606

OWNER *(Name and Address)*:
City of Emmett
601 E. 3rd St.
Emmett, ID 83617

BID
Bid Due Date: July 23, 2020
Description *(Project Name— Include Location)*: Supply of City of Emmett – 12th Street Booster Station

BOND
Bond Number:
Date: July 23, 2020
Penal sum Five Percent of Amount Bid (Words) $ 5% (Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

BIDDER	**SURETY**
Patterson Pump Company (Seal)	Western Surety Company (Seal)
Bidder's Name and Corporate Seal	Surety's Name and Corporate Seal
By:	By:
Signature	Signature (Attach Power of Attorney)
Mellissa Lynch	Lori A. Proch
Print Name	Print Name
VP Contract Compliance	Attorney-in-Fact
Title	Title
Attest:	Attest:
Signature	Signature Cheryl C. May
Title President	Title Surety Account Representative

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond shall be Owner's sole and exclusive remedy upon default of Bidder.

2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.

3. This obligation shall be null and void if:

   3.1 Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or

   3.2 All Bids are rejected by Owner, or

   3.3 Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).

4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.

5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.

6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after the Bid due date.

7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.

8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.

9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.

10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.

11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

Western Surety Company

POWER OF ATTORNEY APPOINTING INDIVIDUAL ATTORNEY-IN-FACT

Know All Men By These Presents, That WESTERN SURETY COMPANY, a South Dakota corporation, is a duly organized and existing corporation having its principal office in the City of Sioux Falls, and State of South Dakota, and that it does by virtue of the signature and seal herein affixed hereby make, constitute and appoint

Stephanie A Rook, Individually, of Ontario, OH
Louis A Colagrossi, Bruce W Lockhart, Lori A Proch, Gary E Roadruck, Kyp L Ross, David J Black, Mary Ann Copley, Kristine M Heinrich, Nicole Green, Cheryl C May, Individually, of Richfield, OH
Mark N Coleman, Individually, of Granville, OH
Sue A Brandal, Individually, of Sandusky, OH

its true and lawful Attorney(s)-in-Fact with full power and authority hereby conferred to sign, seal and execute for and on its behalf bonds, undertakings and other obligatory instruments of similar nature

- In Unlimited Amounts -

and to bind it thereby as fully and to the same extent as if such instruments were signed by a duly authorized officer of the corporation and all the acts of said Attorney, pursuant to the authority hereby given, are hereby ratified and confirmed.

This Power of Attorney is made and executed pursuant to and by authority of the By-Law printed on the reverse hereof, duly adopted, as indicated, by the shareholders of the corporation.

In Witness Whereof, WESTERN SURETY COMPANY has caused these presents to be signed by its Vice President and its corporate seal to be hereto affixed on this 10th day of June, 2019.

WESTERN SURETY COMPANY

Paul T. Bruflat, Vice President

State of South Dakota
County of Minnehaha } ss

On this 10th day of June, 2019, before me personally came Paul T. Bruflat, to me known, who, being by me duly sworn, did depose and say: that he resides in the City of Sioux Falls, State of South Dakota; that he is the Vice President of WESTERN SURETY COMPANY described in and which executed the above instrument; that he knows the seal of said corporation; that the seal affixed to the said instrument is such corporate seal; that it was so affixed pursuant to authority given by the Board of Directors of said corporation and that he signed his name thereto pursuant to like authority, and acknowledges same to be the act and deed of said corporation.

My commission expires
June 23, 2021

J. MOHR
NOTARY PUBLIC SOUTH DAKOTA

J. Mohr, Notary Public

CERTIFICATE

I, L. Nelson, Assistant Secretary of WESTERN SURETY COMPANY do hereby certify that the Power of Attorney hereinabove set forth is still in force, and further certify that the By-Law of the corporation printed on the reverse hereof is still in force. In testimony whereof I have hereunto subscribed my name and affixed the seal of the said corporation this 23rd day of July, 2020.

WESTERN SURETY COMPANY

L. Nelson, Assistant Secretary

Form F4280-7-2012

Go to www.cnasurety.com > Owner / Obligee Services > Validate Bond Coverage, if you want to verify bond authenticity.

Authorizing By-Law

ADOPTED BY THE SHAREHOLDERS OF WESTERN SURETY COMPANY

This Power of Attorney is made and executed pursuant to and by authority of the following By-Law duly adopted by the shareholders of the Company.

Section 7. All bonds, policies, undertakings, Powers of Attorney, or other obligations of the corporation shall be executed in the corporate name of the Company by the President, Secretary, and Assistant Secretary, Treasurer, or any Vice President, or by such other officers as the Board of Directors may authorize. The President, any Vice President, Secretary, any Assistant Secretary, or the Treasurer may appoint Attorneys in Fact or agents who shall have authority to issue bonds, policies, or undertakings in the name of the Company. The corporate seal is not necessary for the validity of any bonds, policies, undertakings, Powers of Attorney or other obligations of the corporation. The signature of any such officer and the corporate seal may be printed by facsimile.

DEPARTMENT OF INSURANCE

STATE OF IDAHO
Certificate No.
414

CERTIFICATE OF AUTHORITY

THIS CERTIFIES, THAT

WESTERN SURETY COMPANY,
a stock company domiciled in SIOUX FALLS, SOUTH DAKOTA

subject to the provisions of its Articles of Incorporation, and having presented satisfactory evidence of compliance with the requirements of the Laws regulating the insurance business in the State of Idaho, has been granted authority to transact such business, in this State, of the class or classes of insurance as indicated below:

CASUALTY - EXCLUDING WORKERS' COMPENSATION, SURETY

Expiration Conditions: This Certificate of Authority is expressly conditioned upon the holder hereof remaining in full compliance with, and not in violation of, any of the applicable Laws and requirements of the State of Idaho. It shall at all times remain the property of the State of Idaho, and shall continue and remain in full force and effect from the date shown hereon, until expired, suspended, revoked or otherwise terminated; subject to payment of the continuation fee and filing of a properly completed annual statement with the Director of Insurance on or before the first day of March of each year. Expiration, suspension, revocation or failure to pay the annual continuation fee or to timely file its properly compiled annual statement shall automatically terminate the insured's authority to conduct the business of insurance in this State and this Certificate of Authority must forthwith be returned to the Department of Insurance of the State of Idaho.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Official Seal of the Department of Insurance to be affixed at Boise, Idaho, this 27th day of August, 1958.

Anthony J. Faciano
Director of Insurance

WESTERN SURETY COMPANY
Sioux Falls, South Dakota
Statement of Net Admitted Assets and Liabilities
December 31, 2019

ASSETS

Bonds	$	1,943,152,245
Stocks		27,166,227
Cash, cash equivalents, and short-term investments		27,903,793
Receivables for securities		-
Investment income due and accrued		17,854,019
Premiums and considerations		56,706,652
Amounts recoverable from reinsurers		1,307,522
Current federal and foreign income tax recoverable and interest thereon		2,678,469
Net deferred tax asset		11,798,536
Receivable from parent, subsidiaries, and affiliates		12,821,583
Other assets		601
Total Assets	$	2,101,389,646

LIABILITIES AND SURPLUS

Losses	$	206,051,147
Loss adjustment expense		52,124,445
Commissions payable, contingent commissions and other similar charges		9,862,381
Other expenses (excluding taxes, license and fees)		3,624
Taxes, License and fees (excluding federal and foreign income taxes)		3,875,999
Federal and foreign income taxes payable		-
Unearned premiums		248,521,840
Advance premiums		6,112,006
Ceded reinsurance premiums payable (net of ceding commissions)		1,673,524
Amounts withheld or retained by company for account of others		5,332,206
Provision for reinsurance		290,516
Payable to parent, subsidiaries and affiliates		2,905
Payable on security transactions		-
Other liabilities		97,836
Total Liabilities	$	533,948,430

Surplus Account:			
Common stock	$ 4,000,000		
Gross paid in and contributed surplus	280,071,837		
Unassigned funds	1,283,369,380		
Surplus as regards policyholders		$	1,567,441,217
Total Liabilities and Capital		$	2,101,389,646

I, Amy Smith, Senior Vice President of Western Surety Company hereby certify that the above is an accurate representation of the financial statement of the Company dated December 31, 2019, as filed with the various Insurance Departments and is a true and correct statement of the condition of Western Surety Company as of that date.

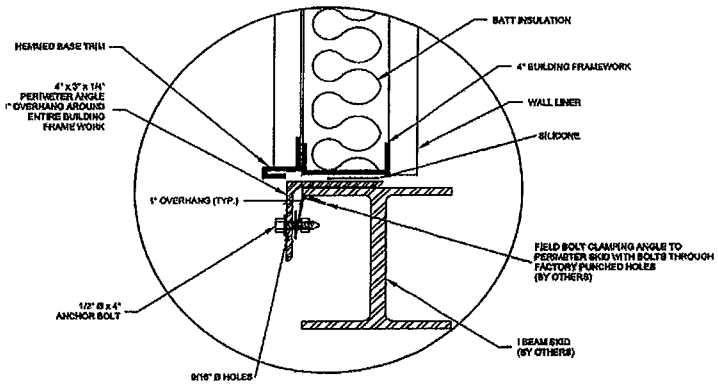
WESTERN SURETY COMPANY

By _____
Senior Vice President

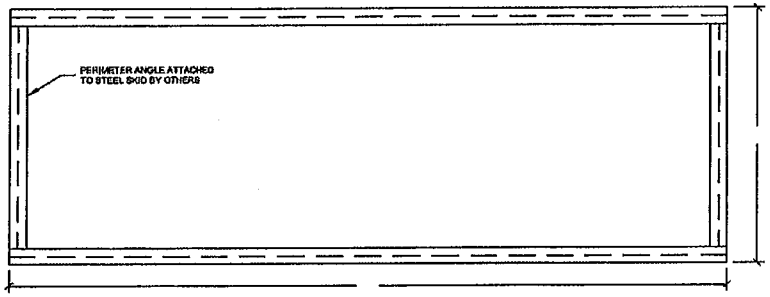
Subscribed and sworn to me this 11 day of March 2020
My commission expires:

YOLANDA JIMENEZ
OFFICIAL SEAL
Notary Public, State of Illinois
My Commission Expires
September 24, 2021

By _____
Notary Public

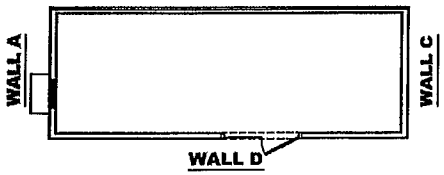


BUILDING ANCHORING DETAIL



STEEL SKID FOUNDATION DIMENSIONS

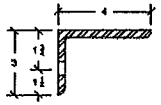
* STEEL SKID DESIGN AND INSTALLATION BY OTHERS *



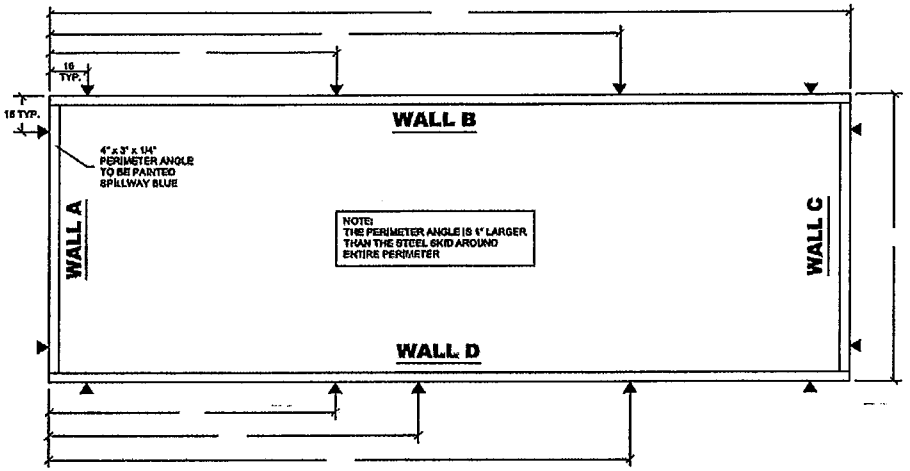
Flo-Pak Integrated Municipal Pumping Systems

STRUCTURAL
STEEL SKID FOUNDATION

DRAWN BY:	CHECKED BY:
C DICKINSON	
DATE	SCALE
1/20/2012	NONE
DRAWING NO.	
0	
SHEET NO.	REVISION
S-1	0

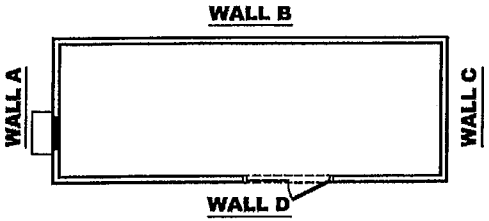


ANCHOR HOLE DETAIL



PERIMETER ANGLE LAYOUT

▶ = 9/16" Ø ANCHOR HOLE LOCATIONS



PERIMETER ANGLE SHALL BE THE STRUCTURE SIZE +1/4" TOLERANCE.

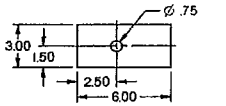
1) APPLY A CONTINUOUS 3/8" BEAD OF A GOOD GRADE OF SILICONE SEALANT ON THE SLAB APPROXIMATELY 1" FROM THE EDGE OF THE SLAB WHERE THE PERIMETER ANGLE OF THE STRUCTURE WILL BE PLACED. APPLY A CONTINUOUS 3/8" BEAD OF A GOOD GRADE OF SILICONE SEALANT BELOW THE INTERIOR WALL WHEN NECESSARY.

2) SNUG ANCHOR BOLTS, DO NOT CLOSE GAP BEHIND THE PERIMETER ANGLE. OVER TIGHTENING THE ANCHOR BOLTS CAN CAUSE THE PERIMETER ANGLE TO WARP, WHICH CREATES PROBLEMS WITH DOOR FITS, ETC.

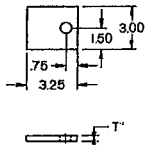
Flo-Pak Integrated Municipal Pumping Systems

STRUCTURAL
PERIMETER ANGLE LAYOUT
STEEL SKID FOUNDATION

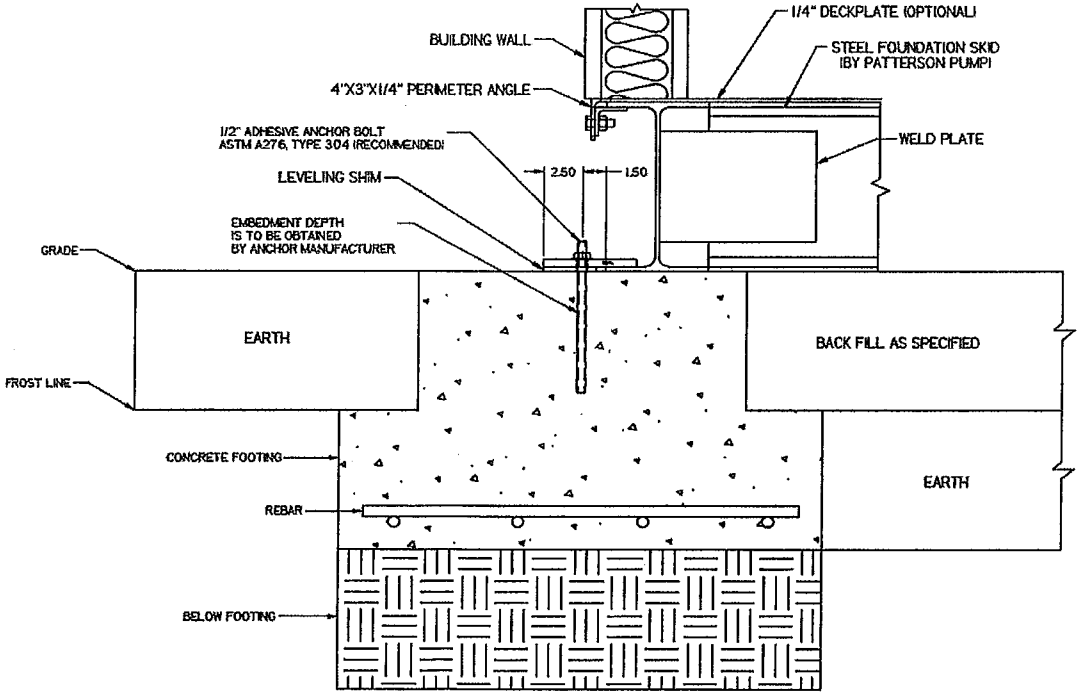
DRAWN BY:	CHECKED BY:
C DICKINSON	
DATE	SCALE
1/20/2012	NONE
DRAWING NO.	
0	
SHEET NO.	REVISION
S-2	0



ANCHOR PLATE



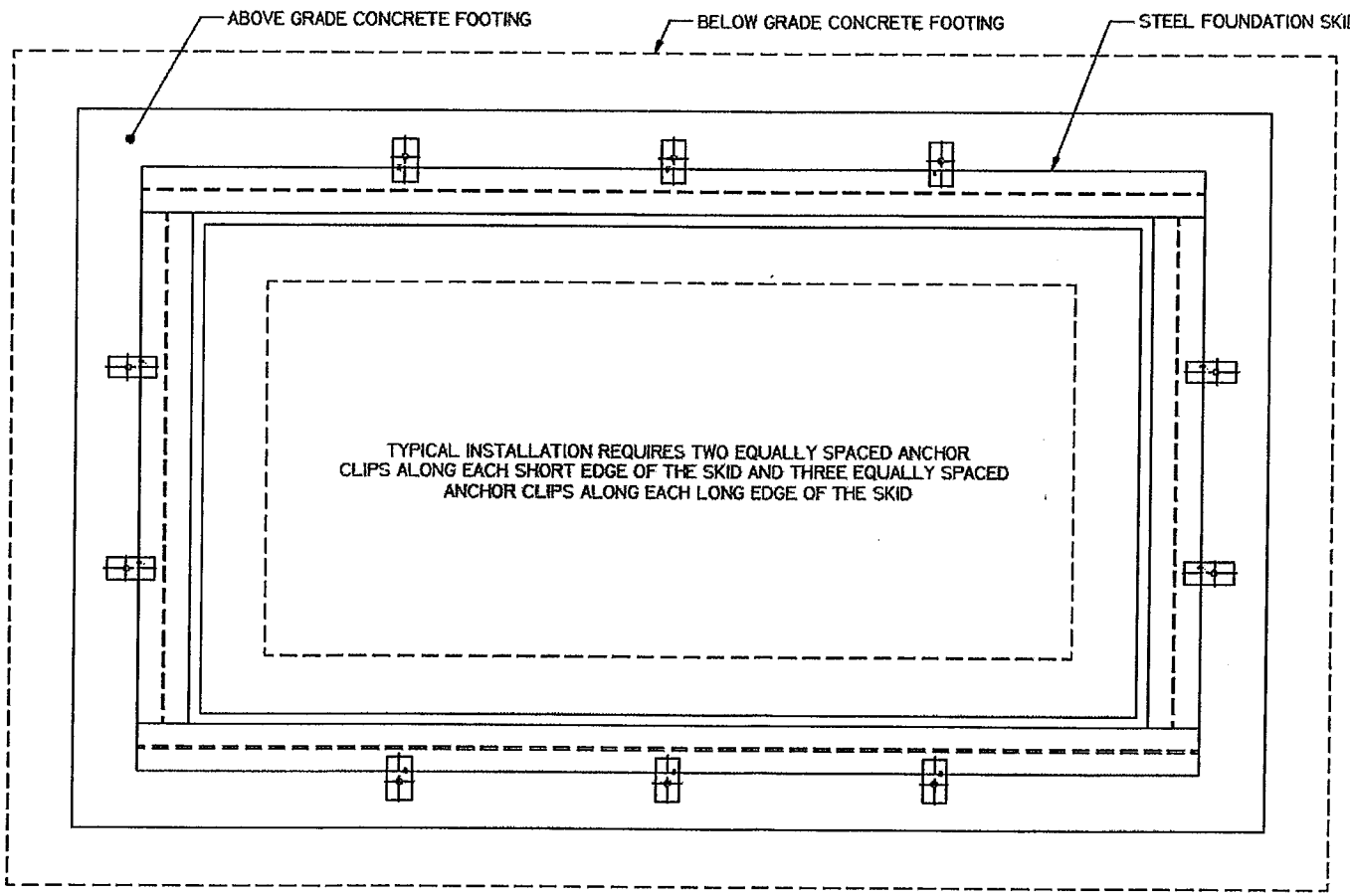
LEVELING SHIM
THICKNESS DEPENDENT UPON
STRUCTURAL STEEL THICKNESS



Fib-Pak Integrated Municipal Pumping Systems

STRUCTURAL
ANCHOR DETAILS
FOOTER STYLE FOUNDATION

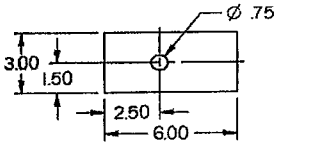
DRAWN BY:	CHECKED BY:
C DICKINSON	
DATE	SCALE
1/20/2012	NONE
DRAWING NO.	
0	
SHEET NO.	REVISION
S-3	0

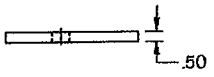


Flo-Pak Integrated Municipal Pumping Systems

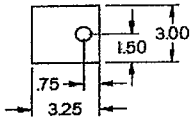
STRUCTURAL ANCHOR LOCATIONS FOOTER STYLE FOUNDATION

DRAWN BY:	CHECKED BY:
C DICKINSON	
DATE	SCALE
1/20/2012	NONE
DRAWING NO.	
D	
SHEET NO.	REVISION
S-3.5	D

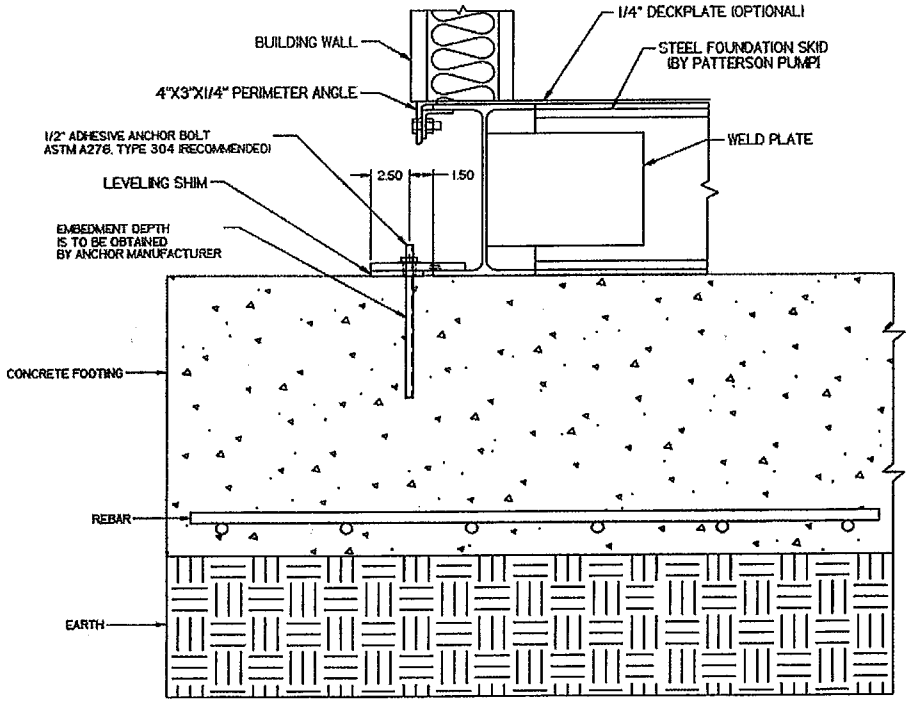




ANCHOR PLATE



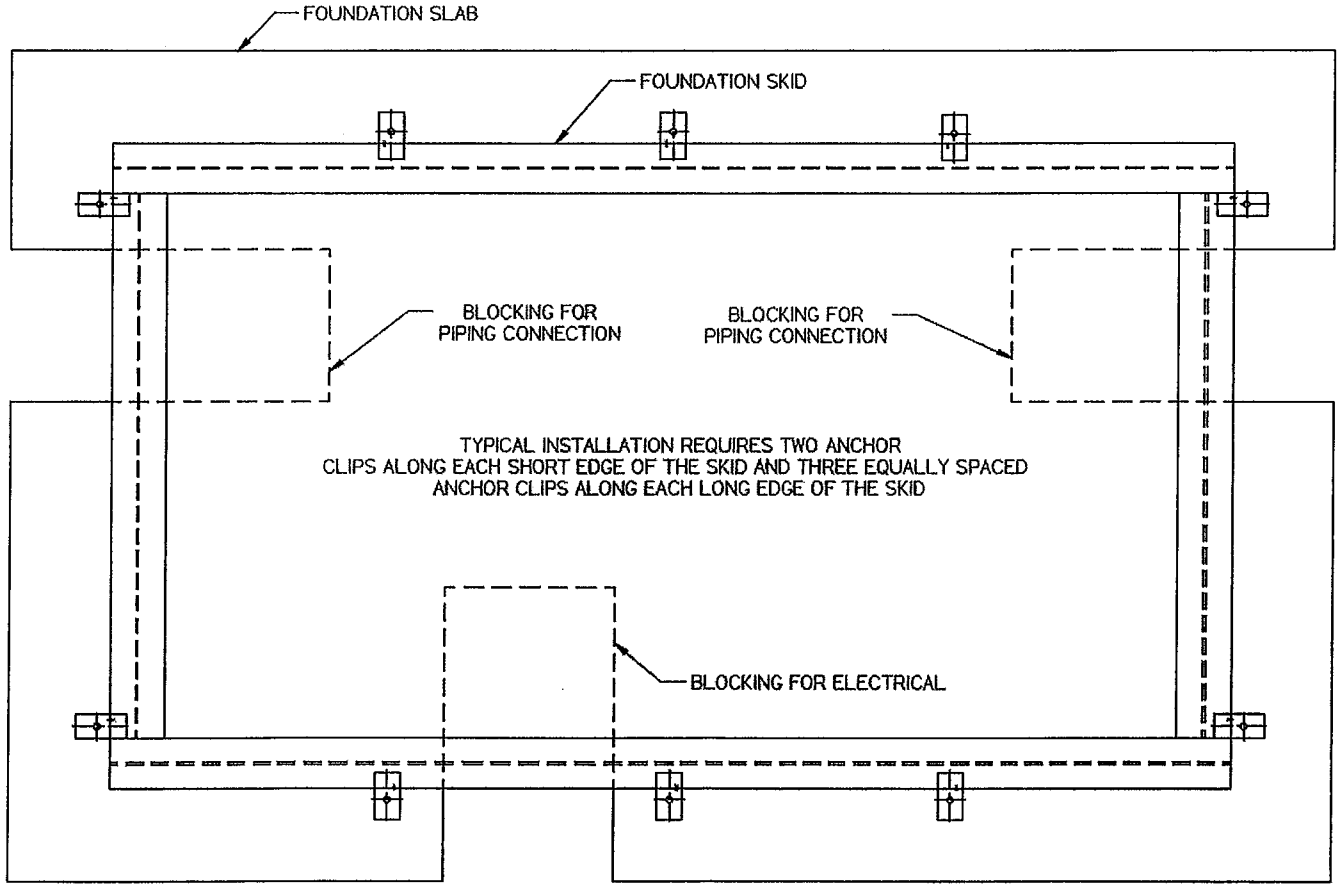
LEVELING SHIM
THICKNESS DEPENDENT UPON
STRUCTURAL STEEL THICKNESS



Pro-Pak Integrated Municipal Pumping Systems

STRUCTURAL
ANCHOR DETAILS
SLAB FOUNDATION

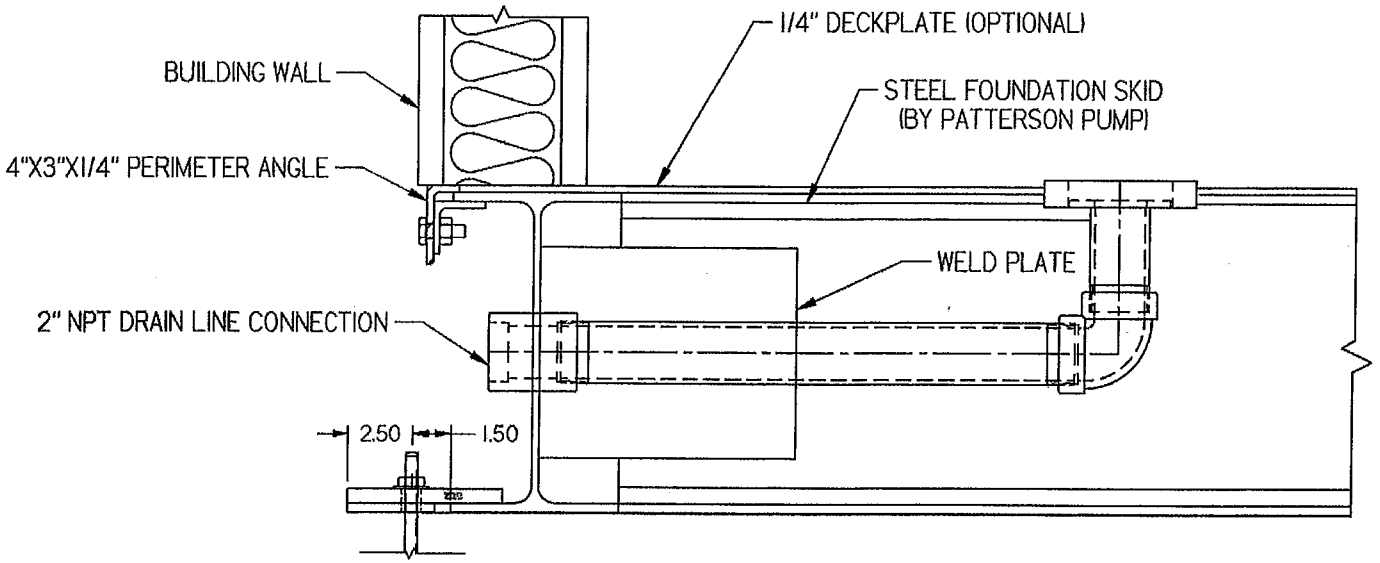
DRAWN BY:	CHECKED BY:
C DICKINSON	
DATE	SCALE
1/20/2012	NONE
DRAWING NO.	
0	
SHEET NO.	REVISION
S-4	0



Flo-Pak Integrated Municipal Pumping Systems

STRUCTURAL
ANCHOR & BLOCK OUT LOCATION
SLAB FOUNDATION

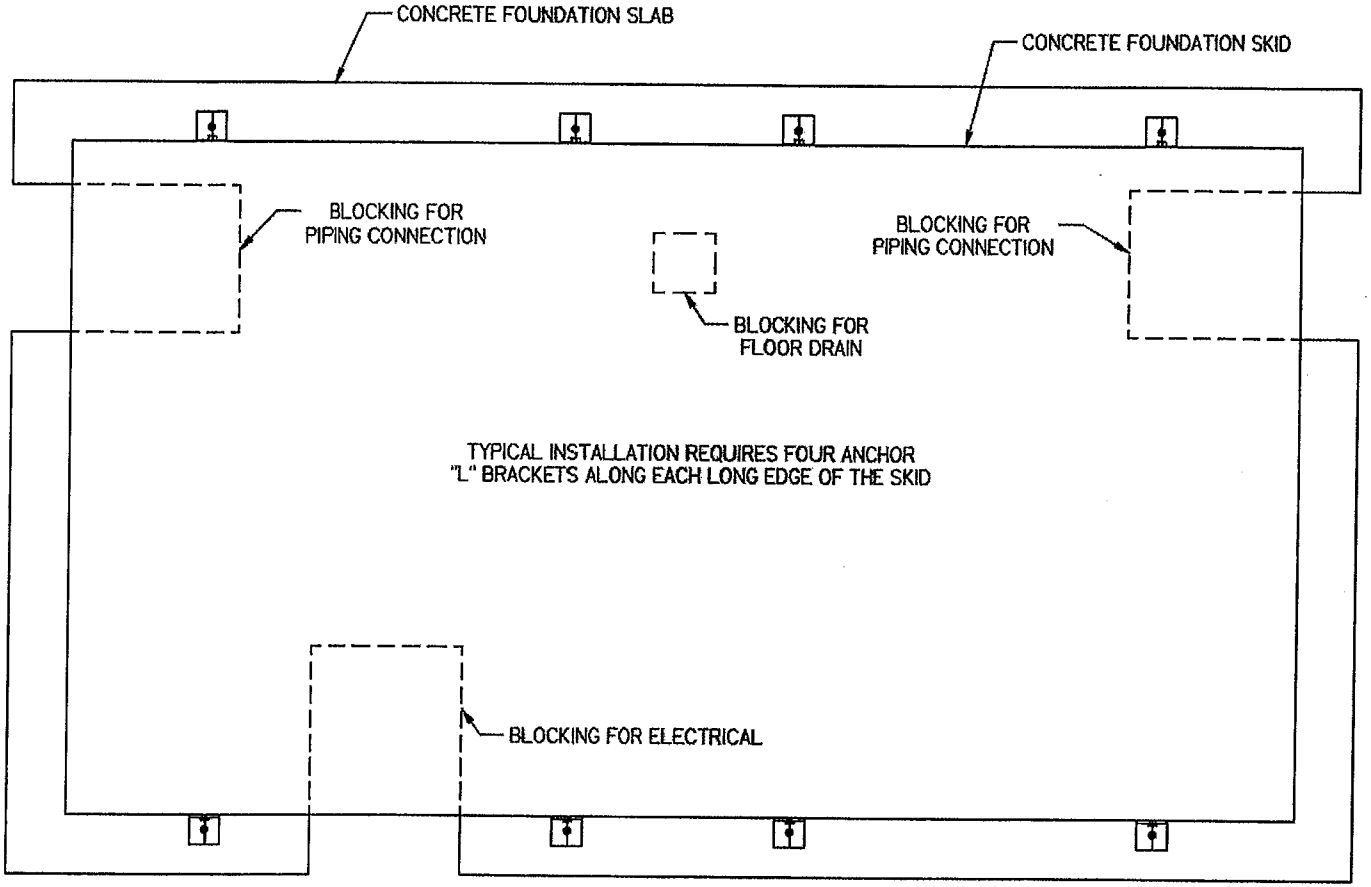
DRAWN BY:	CHECKED BY:
C DICKINSON	
DATE	SCALE
1/20/2012	NONE
DRAWING NO.	
0	
SHEET NO.	REVISION
S-4.5	0



Flo-Pak Integrated Municipal Pumping Systems

STRUCTURAL
FLOOR DRAIN DETAILS

DRAWN BY:	CHECKED BY:
C DICKINSON	
DATE	SCALE
1/20/2012	NONE
DRAWING NO.	
0	
SHEET NO.	REVISION
S-4.5	0



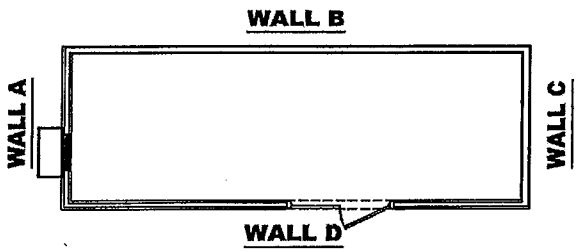
Flo-Pak Integrated Municipal Pumping Systems

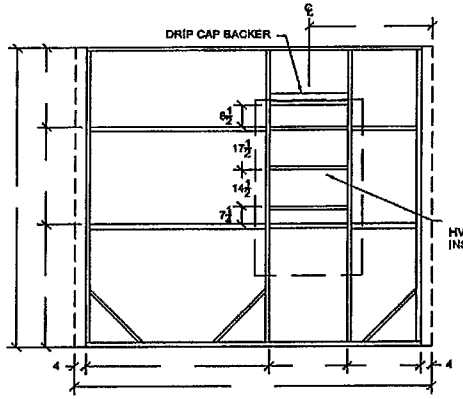
STRUCTURAL
ANCHOR & BLOCK LOCATIONS
SLAB FOUNDATION

DRAWN BY:	CHECKED BY:
C DICKINSON	
DATE	SCALE
1/20/2012	NONE
DRAWING NO.	
0	
SHEET NO.	REVISION
S-4.5A	0

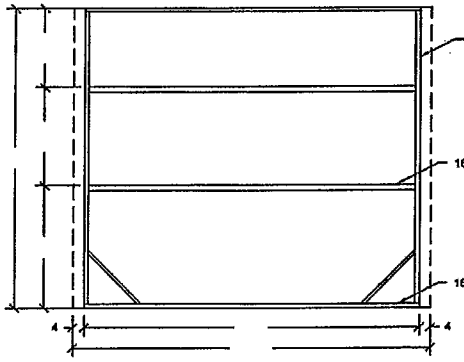
GENERAL NOTES:

1) ALL WALLS ARE VIEWED FROM THE OUTSIDE
2) 4" CHANNELFRAME
3) MATERIAL 16ga. UNLESS OTHERWISE NOTED
4) GIRT DIMENSIONS ARE TO THE TOP OF THE GIRT
5) THE BASE CHANNEL IS WELDED TO THE PERIMETER ANGLE AT 16" INTERVALS IN NO FLOOR BUILDINGS.





WALL A



WALL C

Flo-Pak Integrated Municipal Pumping Systems

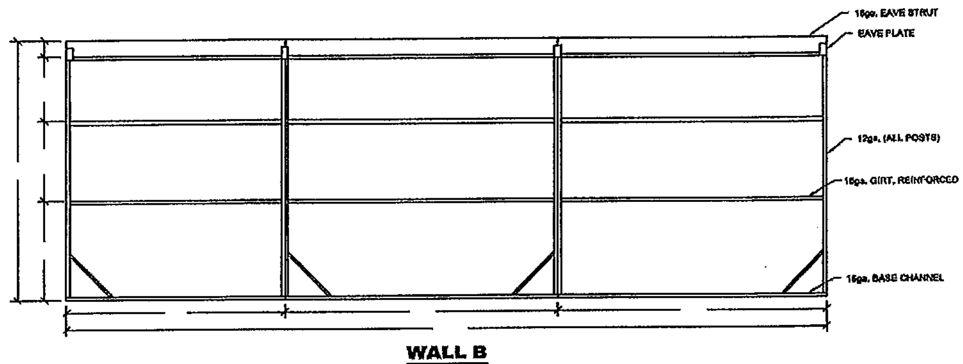
STRUCTURAL

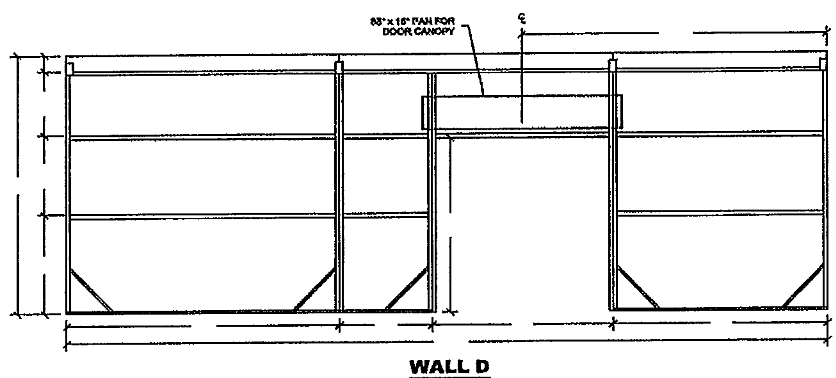
STRUCTURAL FRAMING WALLS A & C

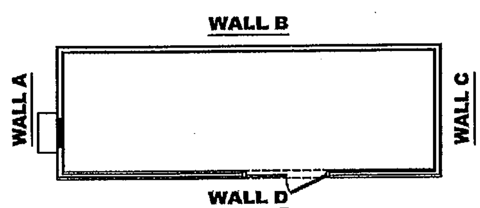
DRAWN BY:	CHECKED BY:
C DICKINSON	
DATE	SCALE
1/20/2012	NONE
DRAWING NO.	
0	
SHEET NO.	REVISION
S-5	0

GENERAL NOTES:

1) ALL WALLS ARE VIEWED FROM THE OUTSIDE
2) 4" CHANNELFRAME
3) MATERIAL 16ga. UNLESS OTHERWISE NOTED
4) GIRT DIMENSIONS ARE TO THE TOP OF THE GIRT
5) THE BASE CHANNEL IS WELDED TO THE PERIMETER ANGLE AT 16" INTERVALS IN NO FLOOR BUILDINGS.



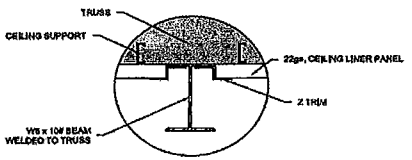




Patterson
Flo-Pak Integrated Municipal Pumping Systems

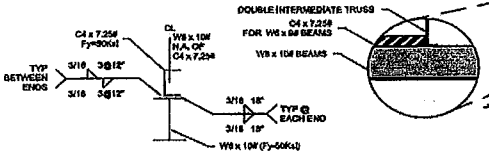
STRUCTURAL
STRUCTURAL FRAMING WALLS B & D

DRAWN BY:	CHECKED BY:
C DICKINSON	
DATE	SCALE
1/20/2012	NONE
DRAWING NO.	
0	
SHEET NO.	REVISION
S-6	0



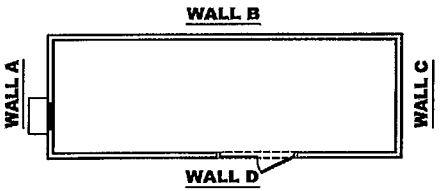
W8 X 10 BEAM DETAIL (FRONT VIEW)
SECTION A - A (TYP)

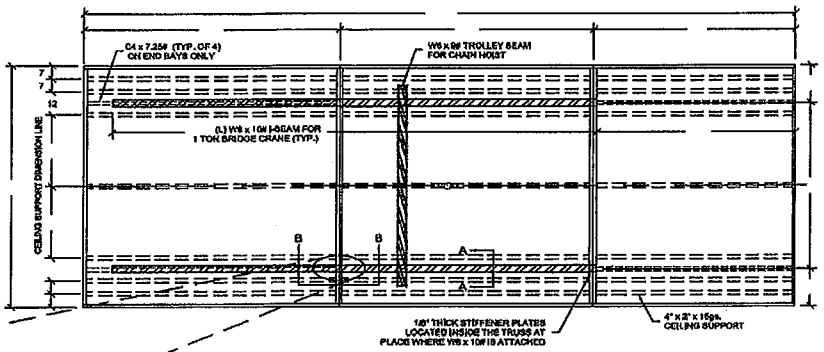
QTY	BRIDGE CRANE SCHEDULE *ITEMS BELOW PROVIDED BY TRACHTE, INC.*
1	1 TON CAP. CM SERIES 622 MANUAL HAND CHAIN HOIST - GRAINGER #5W537
1	1 TON CAP. BRIDGE CRANE KIT - GRAINGER #4ZV99 W8 x 9# SPAN BEAM FOR BRIDGE CRANE KIT
1	1 TON CAP. HEAVY-DUTY TROLLEY - GRAINGER #4Z464

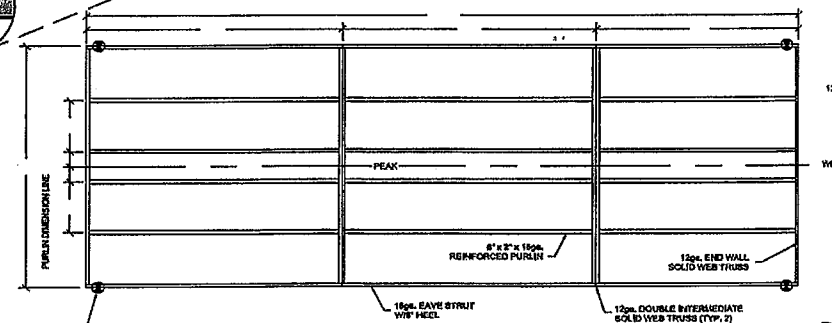


SAFETY NOTE:
ALL WELD JOINTS NEED TO BE ROUTINELY INSPECTED FOR STRESS FRACTURES OR ANY OTHER DEFICIENCIES BEFORE USE.

W8 x 10# BEAM DETAIL (SIDE VIEW)
SECTION B - B (TYP)





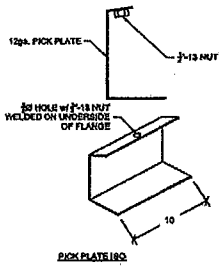


PICK PLATE TO BE MOUNTED AS CLOSE TO END TRUSS AS POSSIBLE WITHOUT HAVING HOLE IN PICK PLATE INTERFERE WITH RAKE TRIM AND HIGH RIB OF ROOF SHEET. -SEE PICK PLATE NOTES - (TYP. 4 CORNERS)

STRUCTURAL ROOF FRAMING

AS VIEWED FROM ABOVE

⑫ = 1/2" PICK RING LOCATION (TYP. OF 4)



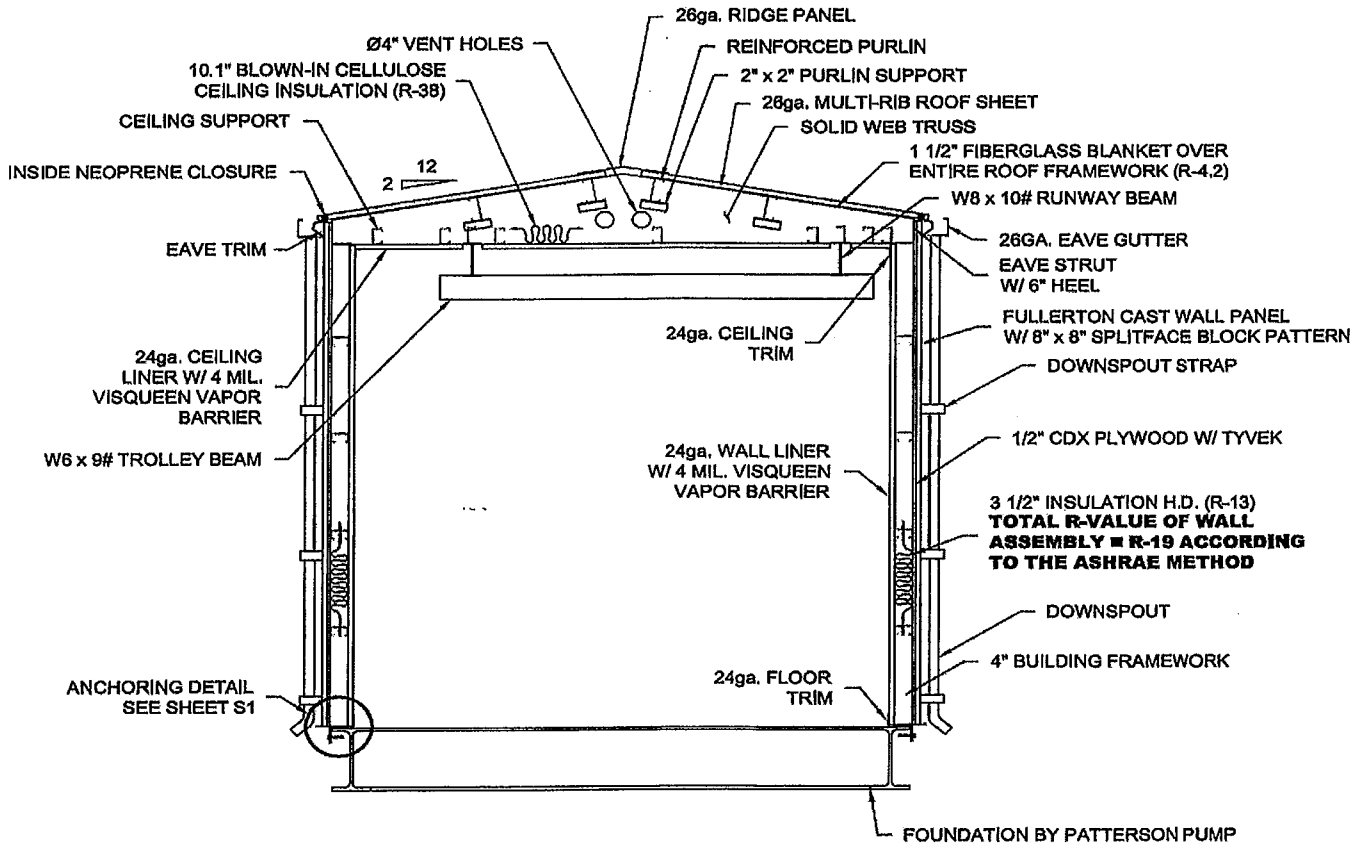
PICK PLATE NOTES

1) WELD 1/2-13 NUT TO UNDERSIDE OF 12ga. PICK PLATE
2) WELD PLATE AS CLOSE AS POSSIBLE TO END TRUSSES WITHOUT INTERFERING WITH RAKE TRIM. PICK PLATE MATCHES PROFILE OF EAVE STRUT
3) THIS DESIGN WILL FACILITATE THE USE OF CUSTOMER SUPPLIED SWIVEL HOIST RINGS (HR-125 STOCK NO. 1015609)

Flo-Pak Integrated Municipal Pumping Systems

STRUCTURAL ROOF FRAMING

DRAWN BY:	CHECKED BY:
C DICKINSON	
DATE	SCALE
1/20/2012	NONE
DRAWING NO.	
0	
SHEET NO.	REVISION
S-7	0



BUILDING SECTION

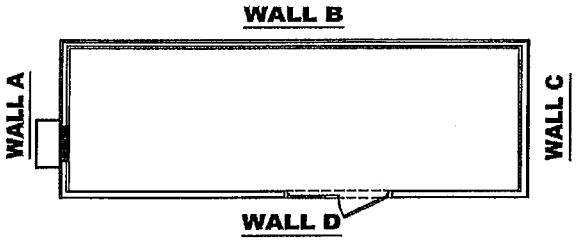
Fe-Pak Integrated Municipal Pumping Systems

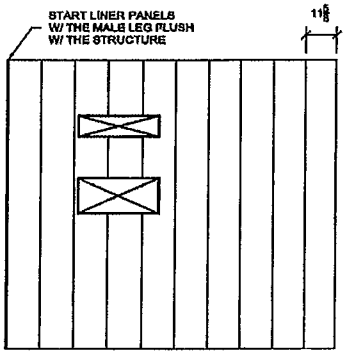
BUILDING SECTION

DRAWN BY:	CHECKED BY:
C DICKINSON	
DATE	SCALE
1/20/2012	NONE
DRAWING NO.	
0	
SHEET NO.	REVISION
S-8A	0

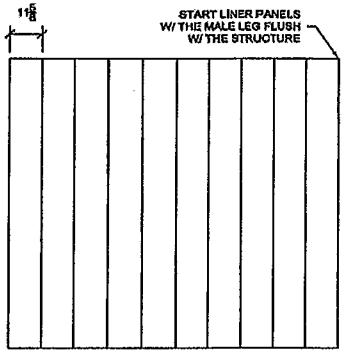
LINER DETAIL

FASTENER SCHEDULE
* LINER PANEL FASTENED TO FRAMEWORK w/ 3/4" DRILLER @ BASE CHANNEL, GIRT, AND TOP CHANNEL (PER PANEL)





WALL A



WALL C

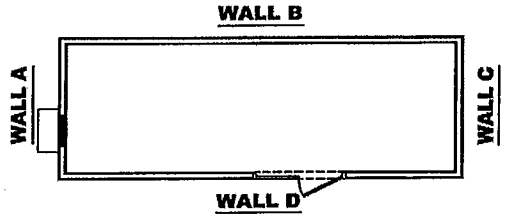
Flo-Pak Integrated Municipal Pumping Systems

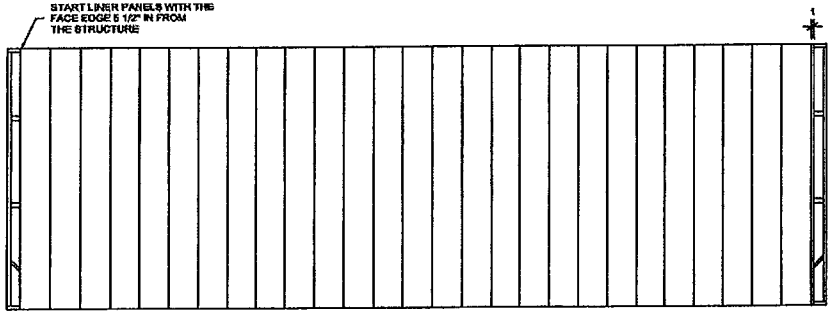
INTERIOR ELEVATIONS WALLS A & C

DRAWN BY:	CHECKED BY:
C DICKINSON	
DATE	SCALE
1/20/2012	NONE
DRAWING NO.	
0	
SHEET NO.	REVISION
S-9	0

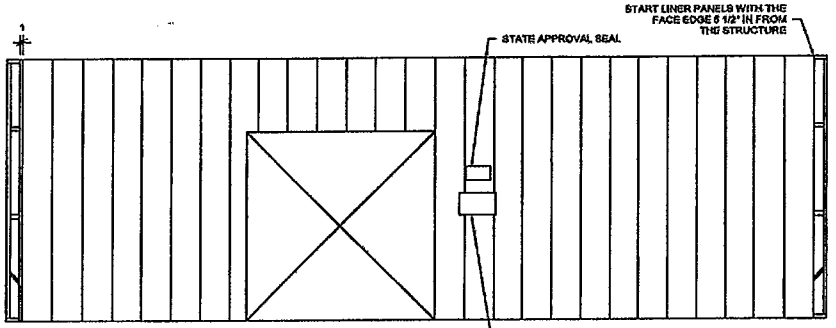
LINER DETAIL

FASTENER SCHEDULE
* LINER PANEL FASTENED TO FRAMEWORK w/ 3/4" DRILLER @ BASE CHANNEL, GIRT, AND TOP CHANNEL (PER PANEL)





WALL B



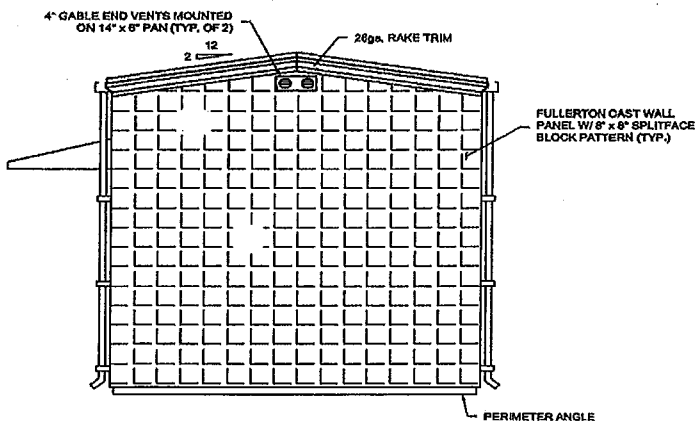
WALL D

Flo-Pak Integrated Municipal Pumping Systems

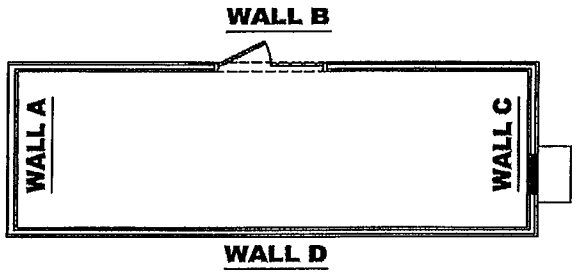
INTERIOR ELEVATIONS WALLS B & D

DRAWN BY:	CHECKED BY:
C DICKINSON	
DATE	SCALE
1/20/2012	NONE
DRAWING NO.	
0	
SHEET NO.	REVISION
S-10	0

QTY	DOOR SCHEDULE
1	6'-0" x 7'-0", NO CENTER POST,18 GA. DOOR,16 GA. FRAME, STD. INSUL. (R-4), RHR ACTIVE PANIC DEVICE: NONE EXTERIOR TRIM: LEVER WITH BEST CONSTRUCTION CORE
6	HINGE - 4 1/2" NRP - SS (32D) - BALL BEARING (BB51)
1	T-LATCH W/HOLD OPEN - 6" ALH #29-6 SS
1	DOOR CLOSER W/HOLD OPEN LCN 4111HEDA (UP TO 4' DOOR)
1	CRASH CHAIN W/VINYL COVER - 25 1/2" - (3/0-3/6)
2	SURFACE BOLTS
1	MAGNETIC DOOR CONTACT - SPDT - POTTER ELECTRIC (AMESCO) - AMS38-WHITE
1	WEATHERSTRIP - REESE
1	THRESHOLD - REESE
3	WATERSHED - REESE (1) 202C & (2) 203C
2	SWEEPS

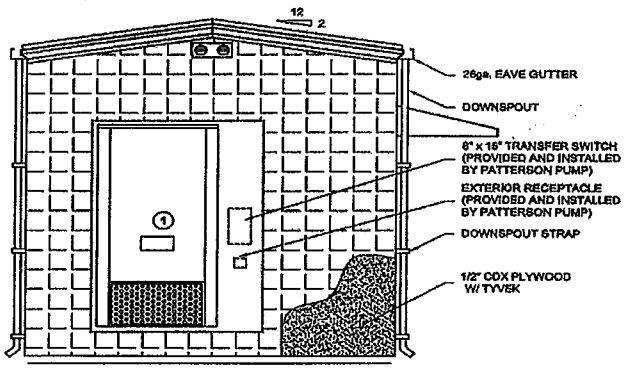


WALL A



WALL B

WALL D



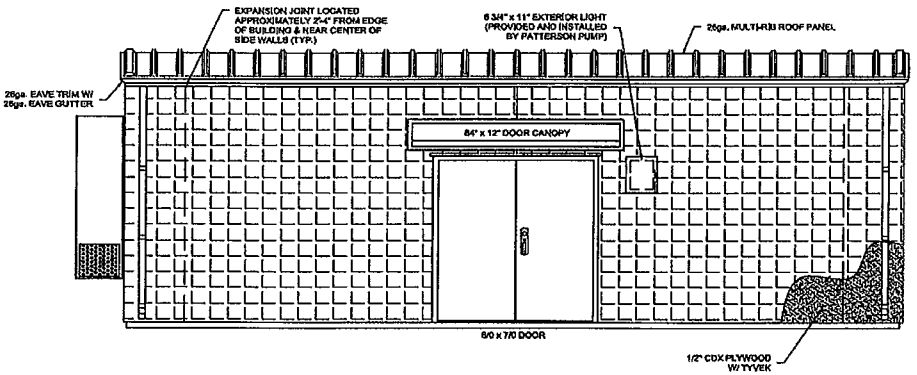
WALL C

Flo-Pak Integrated Municipal Pumping Systems

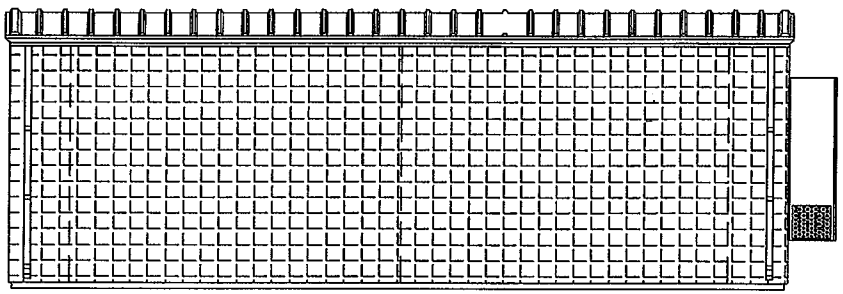
EXTERIOR ELEVATIONS
WALLS A & C

DRAWN BY:	CHECKED BY:
C DICKINSON	
DATE	SCALE
1/20/2012	NONE
DRAWING NO.	
0	
SHEET NO.	REVISION
S-11	0

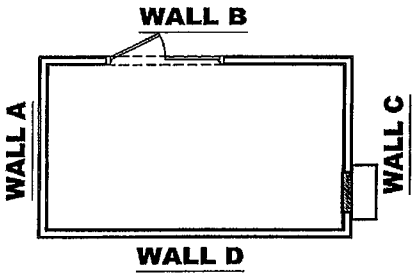
QTY	DOOR SCHEDULE
1	6'-0" x 7'-0", NO CENTER POST,16 GA. DOOR,16 GA. FRAME, STD. INSUL. (R-4), RHR ACTIVE PANIC DEVICE; NONE EXTERIOR TRIM: LEVER WITH BEST CONSTRUCTION CORE
6	HINGE - 4 1/2" NRP - SS (32D) - BALL BEARING (BB51)
1	T-LATCH W/HOLD OPEN - 6" ALH #29-6 SS
1	DOOR CLOSER W/HOLD OPEN LCN 4111HEDA (UP TO 4' DOOR)
1	CRASH CHAIN W/VINYL COVER - 25 1/2" - (3/0-3/6)
2	SURFACE BOLTS
1	MAGNETIC DOOR CONTACT - SPDT - POTTER ELECTRIC (AMESCO) - AMS36-WHITE
1	WEATHERSTRIP - REESE
1	THRESHOLD - REESE
3	WATERSHED - REESE (1) 202C & (2) 203C
2	SWEEPS



WALL B



WALL D

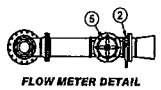


Flo-Pak Integrated Municipal Pumping Systems

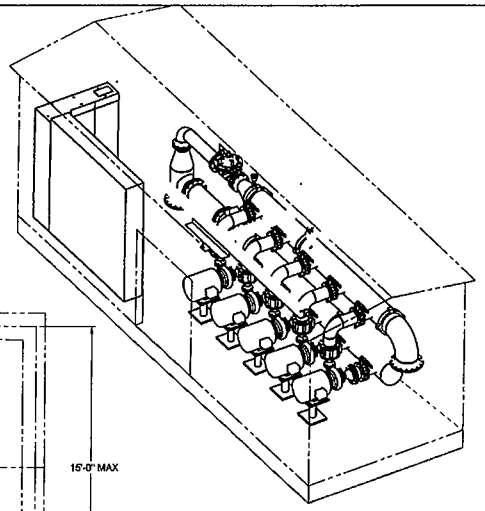
EXTERIOR ELEVATIONS WALLS B & D

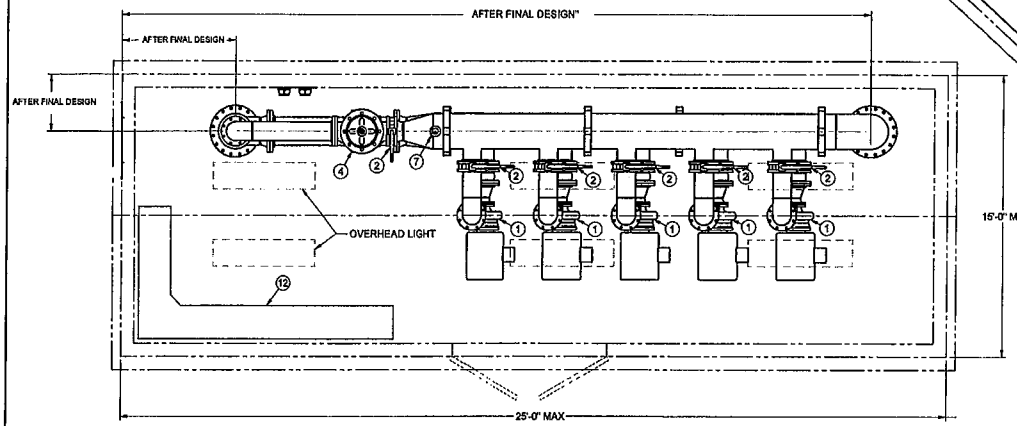
DRAWN BY:	CHECKED BY:
C DICKINSON	
DATE	SCALE
1/20/2012	NONE
DRAWING NO.	
0	
SHEET NO.	REVISION
S-12	0

PRELIMINARY

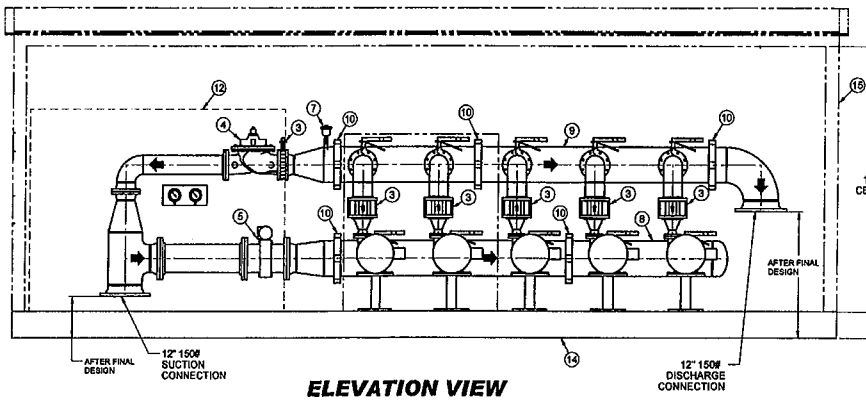


FLOW METER DETAIL

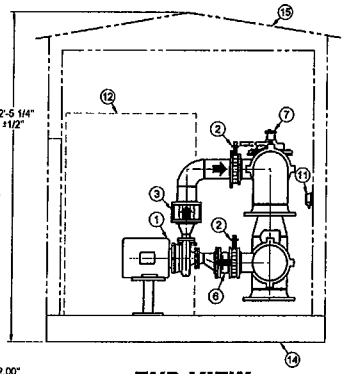




PLAN VIEW



ELEVATION VIEW



END VIEW

PRELIMINARY
DRAWINGS
NOT FOR
CONSTRUCTION

THIS DRAWING IS CERTIFIED

☒ FOR APPROVAL
PRODUCTION AS-BUILT

☐ FOR CONSTRUCTION
PRODUCTION AS-BUILT

ORDER NO.: _____

JOB NO.: _____

KEY LEGEND

ITEM#	QTY.	DESCRIPTION
1	5	PUMPS;
2	11	ISOLATION BFLY VALVE
3	5	CHECK VALVE
4	1	SURGE RELIEF VALVE
5	1	FLOW METER
6	5	FLEXIBLE CONNECTION
7	1	3/4" AIR RELEASE VALVE
8	1	SUCTION HEADER
9	1	DISCHARGE HEADER
10	5	ELASTOMERIC CONNECTION
11	2	4" PRESSURE GAUGE
12	1	ELECTRICAL CONTROLS
14	1	FABRICATED SKID
15	1	FABRICATED BUILDING 32'-0" X 10'-8" X 10'-0"

NOTES:

1: ANCHOR BOLT HOLES AVAILABLE ONLY UPON CUSTOMER REQUEST.

2: IF THERE IS A DRAIN OR ANY OTHER OBSTRUCTION IN THE FLOOR THAT SHOULD BE CONSIDERED, PLEASE LOCATE IT ON THIS DRAWING.

3: PIPING SHALL BE DUCTILE IRON OR EPOXY COATED STEEL.

4: DUE TO VARIATIONS IN THE PIPE FITTINGS, CUSTOMER PIPE CONNECTION LOCATIONS MAY VARY +/- 1/2". IT IS RECOMMENDED THAT PIPING NOT BE ANCHORED RIGIDLY UNTIL FINAL FIT-UP IS COMPLETE.

REV	DATE	DESCRIPTION

FILE-PAK INTEGRATED PACKAGED PUMPING SYSTEMS

JOB TITLE:

ECP:	
REVISED BY:	
DATE:	
ECP:	
REVISED BY:	
DATE:	
CHECKED	S.A.
DRAWN BY:	RWADE
DATE:	7/19/2010
SCALE:	NONE
CAD FILE:	D80-117748
SHEET:	1 of 1
REV	0

The Pump People

Patterson

A Gorman-Rupp Company

PROPOSED MATERIALS

System Manufacturer Representative: Integrity Pump Solutions

System Manufacturer: Patterson Pump Company

Building Manufacturer/Supplier: Trachte USA, Inc.

Duty Pump Manufacturer: Goulds Water Technology (Model 4BF1M9D0)

High Flow Pump Manufacturer: Goulds Water Technology (Model 18BF2U9B9)

Controls Component Supplier: Engineered Systems Group

Controls Component Manufacturers: Allen Bradley with Eaton Mini Power Center

Weight Of Facility: Estimated 65,000 lbs

TRACHTE® Specification

TRACHTE BUILDING SPECIFICATIONS:	Quote #	Rel. Date
Patterson Pump Muni	**108576**	**07/16/20**
12th Street Booster Station		
15' x 25' x 10'7"		
Final Site Location: Emmett, ID		
Delivery Location: Customer Pick-up		
Craig Dickinson		
2129 Ayersville Road		
Toccoa, GA 30577		
706-297-2837		
cdickinson@pattersonpumps.com		

SCOPE

Provide One factory built, pre-assembled, all steel, noncombustible building by TRACHTE, LLC., to include the building, and any pre-installed electrical and HVAC if listed. TRACHTE will provide all building anchor bolts and plates.

DESIGN REQUIREMENTS

The structure design and manufacture shall, as a minimum, conform to ASCE (American Society of Civil Engineers) "Minimum Design Loads for Buildings and Other Structures" and the MBMA (Metal Building Manufacturers Association) "Recommended Design Practices Manual". The specified TRACHTE building shall be designed to support the following loads:

LOADING	PSF
Roof Load:	50
Live / Snow Load:	40
Ceiling Dead Load:	10
(Ice Missile Protection) Impact Load:	No
Wall Wind load (MPH)	120
Floor Live Load:	n/a
Battery Area Load:	n/a
Seismic Design Category:	C
Engineered State	ID
PE Stamped Engineering Calculations and Drawings: (Electrical Engineering is not required for approvals & not included, but is available for an additional charge)	Yes
State Approval Seal:	Yes

APPROVAL DRAWINGS

A Structural and Electrical set of "Approval Drawings" shall be submitted. These will be in PDF format (Adobe Acrobat), showing the building floor plan, dimensions, elevations and location of all primary accessories included with the building. Drawing format shall be 11" x 17" prints and/or E-Mail files using WinZip. "As Built" Drawings will be sent out upon shipment of the building in PDF format and / or paper copy. A paper copy will also be enclosed with the "Operations and Maintenance Manual". Drawings are created in AutoCad2010 Format and are available upon request.	3 sets of Extra Manuals

GENERAL BUILDING INFORMATION

Building shall be a pre-assembled, metal-framed, noncombustible building by Trachte, LLC. Oregon, Wisconsin. Built to size and with accessories listed below:

Building Frame Size:	15' x 25' x 10'7"
Interior Dimensions:	14'2" x 24'2" x 10'
Outside Building Shipping Dimensions:	15'8" x 27'4" x 12'5"
Approximate Building Weight:	10,000#
** Above shipping height does not include trailer height.*	

TRACHTE Specification

DESCRIPTION	NOTES	QTY
QUALITY ASSURANCE		
The Manufacturer's comprehensive compliance control program follows the building through all phases of production. Building shall be manufactured to satisfy current state manufactured building program rules, regulations, and codes (e.g. IBC International Building Code) and the NEC (National Electric Code). Weld Connections shall adhere to current AWS D1.1 and D1.3 Structural Welding Codes. Trachte Southeast, LLC., Eastanollee, GA is an ISO 9001:2008 registered company.		
BUILDING WARRANTY		
TRACHTE guarantees the complete building from defects in materials and workmanship for a period of Two (2) Years, except as limited by the original equipment manufacturer(s) of component parts. Detailed information available at www.trachteusa.com.		
COATING SYSTEM WARRANTY		
Kynar 500® Coating System Limited Warranty Warrants the factory applied Kynar 500® or Hylar 5000® Fluropon coating systems applied over a Galvalume or Galvanized substrate when used on the Metal Exterior Walls and Roof for a period of Forty (40) Years against cracking, checking or peeling and Thirty (30) Years against fading and chalking. Warranty only covers panels erected in the continental United States, Alaska, and Canada. The warranty is null and void for any material that is subjected to salt spray or installed on property 1,500 feet or less from a saltwater environment. Detailed information regarding this warranty available at www.trachteusa.com.		
Foundation Design		
Foundation Design is by Customer. Trachte will need to know size & design of foundation so that Trachte may finalize the floor design and provide the correct anchoring material. The drawings will include a foundation design based on customer feedback.		
Building to be set on a Base / Floor system that is to be supplied by others. No hardware for anchoring is supplied by Trachte.	Foundation By Others	1
Base Frame Design		
PERIMETER ANGLE - Base Frame		
Perimeter Angle - 4" x 3" x 1/4" - 5.8#/ft - Hot Rolled Steel - Painted same color as exterior - Unless otherwise requested by Customer	LF	80
Caulk - Silicone clear - Sill Sealant	EACH	8
Base Frame - Paint System		
Sherwin-Williams Industrial Macropoxy 646 Fast Cure Epoxy. This self-priming catalyzed system is designed to provide an extremely durable, VOC (EPA Method 24) compliant coating. Suitable for heavy industrial, severe coastal, offshore or chemical environments where superior corrosion protection and resistant to fading is required. The paint system has a minimum Dry Film Thickness, per coat of 5-7 mils.		
Truss and Structure Design		
STRUCTURE: Building will be composed of 12 ga. and 16 ga. (4") galvanized steel for "Channel frame" framework. This framework will include Posts, Base, Girts, Eave Struts, Purlins, Post Bracing and Connecting plates. Framework to have a flush wall, post and beam format with full trusses on both end walls. These end wall trusses will easily allow for future expansions and/or modifications.		
Fall protection - Single person, stainless steel D-ring anchor point assemblies built into the roof, designed to meet the OSHA 1910.66c requirements for fall protection.	EACH	1
Gable Roof Design		
Truss - Full Solid Web Design - Hot Rolled	12 ga.	6
Truss Heel Height - in inches	6	
Roof Pitch	2:12	

TRACHTE® Specification

Exterior Wall Design		
Architectural Steel Ribbed Panel is Overlapping and fastened with self-tapping fasteners with washers. Paint finish per below over the Galvalume sheet, customer's choice of standard "Trachte" colors.		
26 ga. Multi-Rib Wall Sheet with Kynar 500® PVDF Coating System, 36" wide, 1-1/4" Rib	SF	833
Roof Design		
Architectural Steel Ribbed Panel is overlapping and fastened with self-tapping fasteners with washers. Paint finish per below over the Galvalume roof sheet, customer's choice of standard "Trachte" colors. Rib Closures are located at all required locations. Full ridge caps on all buildings, except single slope designs.		
Roof Overhang - Standard 4"		
26 ga. Multi-Rib Roof Sheet with Kynar 500® PVDF Coating System, 36" wide, 1-1/4" Rib	SF	375
Building Accessories		
Wall Openings are fully Framed, Sleeved, Trimmed, and provided with a Drip Cap.		
Perforated closer for gable end ventilation at each end wall for attic ventilation	LOT	1
Bilco Roof Hatch 36"x30"	EACH	2
Insulation Design		
Wall Insulation (Total wall insulation value at right):	**R-19**	1
- 3-1/2" HD Fiberglass Batt x 24" - R13 - (180 SF/pkg)	SF	806
- 2" Fiberglass Wall Blanket Insulation - Thermal Block Between Steel	SF	806
- Visqueen Vapor Barrier - 4 Mil Thickness - Location as required based on final site location	SF	806
Roof / Ceiling Insulation (Total insulation value at right):	**R-40**	1
Blown-In Cellulose Insulation	R-40	1
- 2" Fiberglass Wall Blanket Insulation - Thermal Block Between Steel	SF	375
- Visqueen Vapor Barrier - 4 Mil Thickness - Location as required based on final site location	SF	375
Interior Wall Finish		
22 ga. Steel Liner Panel with Galvalume substrate, Roll-Formed, Regal White, Kynar 500® Paint. - Flush Fit design w/concealed fasteners.	SF	806
Full Interior Trimming - Corner and Floor - Regal White	LF	120
Wall Liner Reinforced with 16 ga. 6" Wall Hat Channel as needed for equipment support	EACH	1
Interior Ceiling Finish		
22 ga. Steel Liner Panel with Galvalume substrate, Roll-Formed, Regal White, Kynar 500® Paint. - Flush Fit design w/concealed fasteners.	SF	375
Reinforced w/16 ga. 4" Ceiling Hat channel as needed for Equipment Support	LOT	1
Full Ceiling Edge Trim - 24 ga. Regal White	1	

TRACHTE® Specification

Door Design		
1-3/4" Thick Doors and Frames are hot dipped galvannealed to ASTM designations A924 and A653 then factory primed and painted with Acrylic Urethane Enamel. All exterior doors have a top of door Watershed, Drip Cap extending 3" past each side of door, Sweep, Weather-stripping and Threshold.		
Double Door - 6/0 x 7/0 - No Center Post - w/2 Surface Bolts	EACH	1
Magnetic Door Contact	EACH	2
18 ga. Door / 16 ga. Door Frame - Standard	EACH	1
Standard Door Insulation (R-4 - Polystyrene)	EACH	1
Hinge - 4-1/2" NRP - SS (32D) - Ball Bearing (BB51)	EACH	6
Door closer w/hold open LCN 4111HEDA (up to 4' door)	EACH	1
Crash chain 25-1/2" w vinyl cover - (3/0 - 3/6)	EACH	1
Panic Device, Von Duprin - 22 Series Size 3 - Rim - under 48" Door width	EACH	1
Exterior Handle Type: Thumb latch Pull with Cylinder Lock	EACH	1
Lockset Type: Construction Core	EACH	1
Lockset Core Manufacturer: Best	EACH	1
Stainless Steel Pull Handle mounted to the inside of the door.	EACH	1

Shipping and Site Information	
Maximum Shipping Width:	15'8"
Estimated Number of Truck Loads Required:	1
F.O.B. Toccoa, GA (Freight by others)	

Items that Extend Past Exterior Trim: (Include Item and Location: Sidewall or Endwall)		
Hood - Side Wall	Shipped Loose	Attached by Others on Site

END OF TRACHTE "BUILDING" SPECIFICATIONS

NOTE: Please see the Clarifications and Exceptions following the Trachte Electrical Specifications

TRACHTE Specification

TRACHTE ELECTRICAL SPECIFICATION

Codes

All grounding, workmanship and materials shall conform, as a minimum, to the 2017 (NEC) National Electric Code.

Conduit

N/A

Conductors

N/A

Quantity		Description	Manufacturer	Catalog
Switches				
	1	Switch/ Single-Pole/ 20A/ Ivory	Hubbell	CSB120I
Controls				
	2	Alarm/ Magnetic Door Contact/ SPDT/ 200VDC	Potter Electric	BMC33B
Ventilation				
	1	Fan/ Exhaust/ 10"/ 600cfm/ Backdraft Damper	Dayton	484X37
	1	Intake/ Louvered/ 16"/ Motorized Damper	Dayton	4C560
	1	Wall Vent, 36" x 36". 304SS Hood, Aluminum Louver	KEES	

Notes

NO Written Specifications Provided. This electrical specification reflects Trachte's interpretation of supplied information at the time of bid. Trachte may have chosen to substitute Trachte standard materials or designs when either clear direction did not exist, or the standard approach offered quality or cost benefits. Trachte expects customer to view Trachte's specification in detail to insure that Trachte correctly interpreted the customer intended scope of work for this quote and request changes as necessary to meet their needs and intent.

TRACHTE Specification

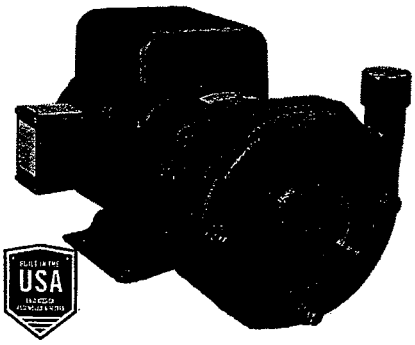
Electrical Exceptions to Customer Specifications
• **This Trachte quotation is for the mount only of door contacts, exhaust fan, louver and vent. No wiring or conduit has been provided. All other house electrical is by others.**
• **Ventilation: No information was submitted that indicated sizes for exhaust fan, louver or wall vent. Wall vent provided in this quotation is 36" x 36". Customer is expected to critically review the equipment provided to determine if it will meet their requirements. Any changes to the equipment quoted will require a change order.**
• Information about the sensible & latent heat load produced by equipment within the building was not available at bid time. This information is needed in order to properly size the HVAC unit. Any changes to the HVAC system design due to revised heat dissipation values shall require a change order.
• Grounding: No grounding material has been provided in this quotation.
• Trachte shall meet the State modular building code requirements, yet no local codes or permits have been evaluated or considered.
• This electrical quotation reflects Trachte's standard approach of meeting the requirements of the latest version of the NEC or those of the state modular building program for the final site location. In doing so it may not meet other local or customer requirements. It is the customer's responsibility to review this quotation in detail and bring questions regarding these requirements to Trachte's attention for resolution.
• Trachte shall supply and install equipment listed herein this specification only, all other equipment shall be supplied and installed by others. This Specification reflects Trachte's best interpretation of information supplied at the time of proposal. Trachte expects Customer to critically review Trachte's specification to ensure that Trachte correctly interpreted their scope of work for this proposal. Customer is to use this Trachte Specification to determine exactly what Trachte includes and intends to provide. Any changes or additions to this Trachte Specification will result in a Price Adjustment or a Change Order.
• This electrical specification reflects Trachte's interpretation of supplied information at the time of bid. Trachte may have chosen to substitute Trachte standard materials or designs when either clear direction didn't exist or the standard approach offered quality or cost benefits. Trachte expects customer to review Trachte's specification in detail to insure that Trachte correctly interpreted the customer intended scope of work for this quote and request changes as necessary to meet their needs and intent.
Items supplied and installed by others will include but not limited to the below items.
• All house electrical other than mounting of exhaust fan, louver and wall vent
• Fiber Tray
• Safety Equipment (eye wash station, fire extinguisher)
• GPS Antenna
• Nameplates & Signage
• Card Readers
• Any electrical equipment or device not listed
Items Supplied by Customer and Installed by Trachte include the below items:
• None

Structural Exceptions to Customer Specifications	SPEC Section
• Trachte standard fasteners included.	ALL
• This specification reflects Trachte's best interpretation of information supplied at the time of bid. Trachte expects customer to review Trachte's specification to ensure that Trachte correctly interpreted their scope of work for this bid.	ALL

GOULDS
WATER TECHNOLOGY
a xylem brand

Customer	Date 03.07.2020
Contact	Project
Phone number	Project no.
Email	

4BF1M9D0

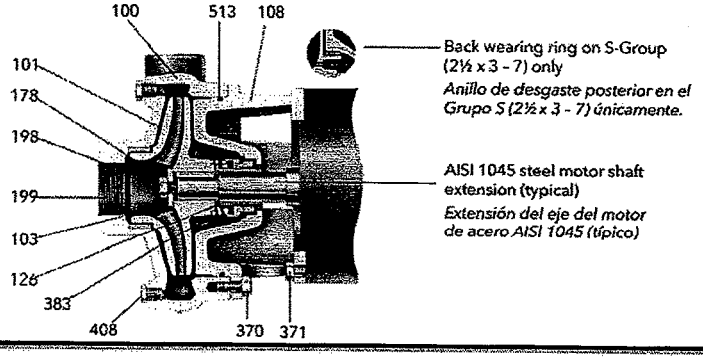


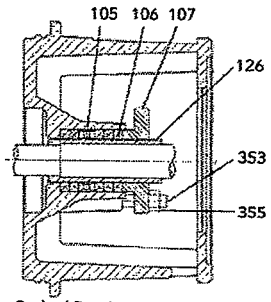
Construction Data

Pump Materials

100 - Casing	Gray cast iron ASTM A48 CL20B
101 - Impeller	Silicon bronze ASTM B584, C87500
103 - Casing wear ring	Bizmuth brass
108 - Adapter	Cast iron ASTM A48 CL30
184 - Seal housing (One piece with adapter)	Cast iron ASTM A48 CL30
198 - Impeller bolt	AISI Type 300 series stainless steel
199 - Impeller washer	AISI Type 300 series stainless steel
178 - Impeller key	Carbon Steel
370 - Hex head cap screw (adapter to case)	Steel SAE 1200 Grade 5
371 - Hex head cap screw (adapter to motor)	Steel SAE 1200 Grade 5
383 - Mechanical seal	See seal chart
408 - Pipe plug 1/4" or 3/8"	Steel
513 - O-ring	BUNA-N

3656 S-GROUP MATERIALS OF CONSTRUCTION
MATERIALES DE CONSTRUCCIÓN - GRUPO S, MODELO 3756



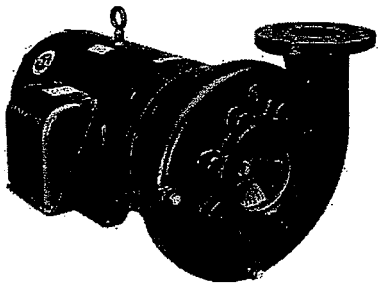


Packed Box Arrangement
Caja prensaestopas

Remarks:

GOULDS
WATER TECHNOLOGY
a xylem brand

Customer	Date 26.06.2020
Contact	Project
Phone number	Project no.
Email	



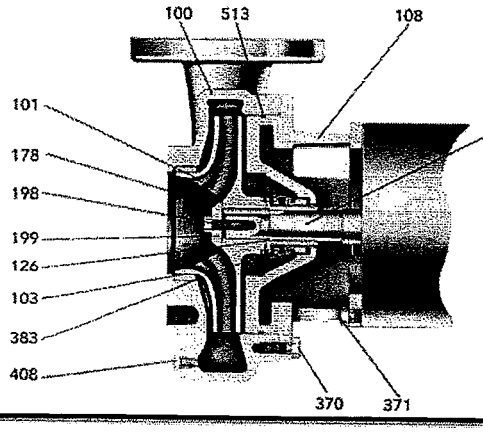
18BF2U9B9

Construction Data

Pump Materials

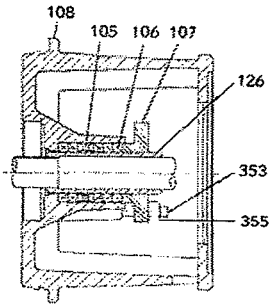
100 - Casing	Gray cast iron ASTM A48 CL20B
101 - Impeller	Silicon bronze ASTM B584, C87500
103 - Casing wear ring	Bizmuth brass
108 - Adapter	Cast iron ASTM A48 CL30
178 - Impeller key	Carbon Steel
184 - Seal housing (One piece with adapter)	Cast iron ASTM A48 CL30
198 - Impeller bolt	AISI Type 300 series stainless steel
199 - Impeller washer	AISI Type 300 series stainless steel
370 - Hex head cap screw (adapter to case)	Steel SAE 1200 Grade 5
371 - Hex head cap screw (adapter to motor)	Steel SAE 1200 Grade 5
383 - Mechanical seal	See seal chart
408 - Pipe plug 1/4" or 3/8"	Steel
513 - O-ring	BUNA-N

3656 M & L-GROUP MATERIALS OF CONSTRUCTION
MATERIALES DE CONSTRUCCIÓN - GRUPO M Y L, MODELO 3656



ANSI 1045 steel motor shaft extension (typical)

ANSI 1045 extensión del eje del motor de acero (típica)

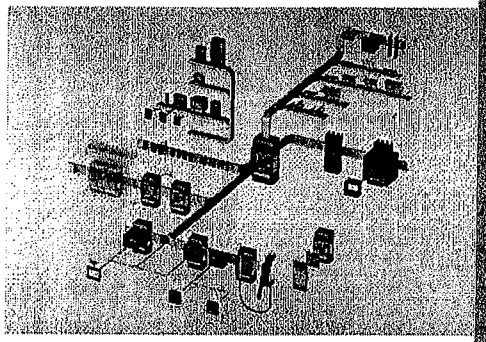


Packed Box Arrangement
Caja prensaestopas

Remarks:

Highlights

- Compliance with global standards having certification in accordance with UL 489 and IEC 60947
- Minimum space requirement thanks to the compact design
- Extensive selection of internal accessories (auxiliary and alarm switches, shunt trips)
- Available as molded case switch in a molded case circuit breaker design
- Minimal effort for planning and configuration as a result of extensive CAD data
- Knowledge Manager: technical information on a specific device can be accessed directly via QR code
- Extensive accessory program for operation (front- or door-mounted rotary operators, MaxFlex cable operators and motor operators)



An extensive portfolio for greater flexibility: a wide range of internal accessories, a variety of connection technologies, and manual operators with handle or Bowden cable (Max-Flex).

Published by
Siemens 2020

Siemens Industry, Inc.
3617 Parkway Ln
Peachtree Corners, GA 30092

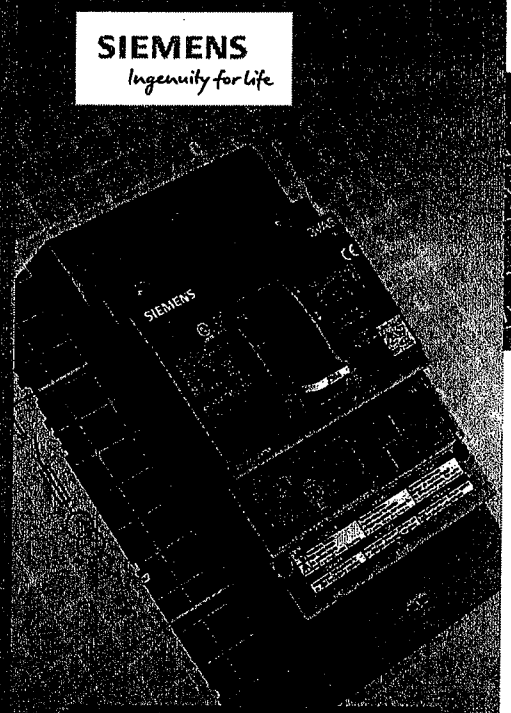
Siemens Technical Support: 1-800-333-7421
info.us@siemens.com

Order No. CDFL-3VA56-0720

Printed in USA-CP

The technical data presented in this document is based on an actual case or on as designed parameters, and therefore should not be relied upon for any specific application and does not constitute a performance guarantee for any projects. Actual results are dependent on variable conditions. Accordingly, Siemens does not make representations, warranties, or assurances as to the accuracy, currency or completeness of the content contained herein. If requested, we will provide specific technical data or specifications with respect to any customer's particular applications. Our company is constantly involved in engineering and development. For that reason, we reserve the right to modify, at any time, the technology and product specifications contained herein.

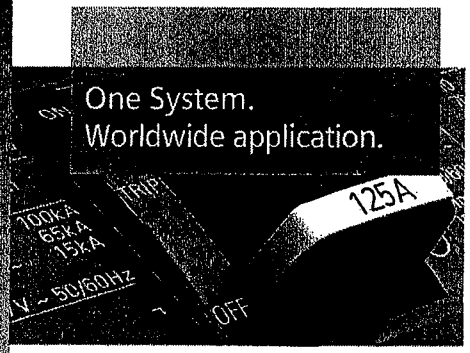
SIEMENS
Ingenuity for life



3VA5 and 3VA6 molded case circuit breakers

With UL certification in accordance with North American standards

usa.siemens.com/3VA



UL and IEC certified for global challenges

3VA molded case circuit breakers are ideal for machine and switchgear manufacturers who export worldwide: The system complies both with the UL standard and the IEC standard. This enables you to take advantage of all functionalities for systems that are used in North America as well as in Europe. In addition, you are compliant with the relevant standards.

More than 500 accessory components make the modular, highly variable molded case circuit breaker system the perfect solution for all applications – worldwide.

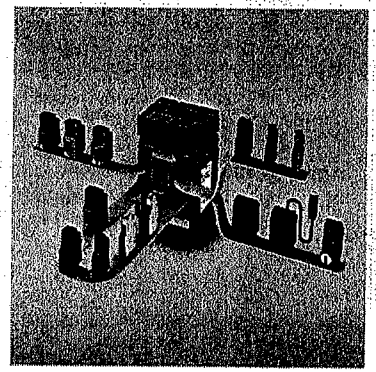
Safety Tested

c UL us LISTED

The 3VA molded case circuit breakers comply with the North American UL standard.

Potential applications

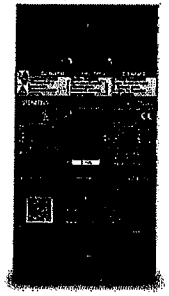
Infrastructure	Industrial applications
• Hospitals	• Machine building
• Logistic centers	• Industrial parks
• Office complexes	• Presses
• Airports	• Wastewater treatment facilities
• Residential buildings	• Production lines
	• Production and process automation



Numerous auxiliary and alarm switches provide a variety of additional functions for every application.

The 3VA5 molded case circuit breaker. Ideal for standard applications.

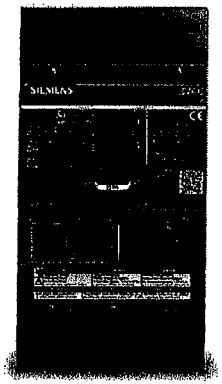
- Line protection from 15 A to 800A
- Breaking capacity up to 100kA at 480V AC
- 1, 2, 3 and 4 pole breaker versions
- Thermal-magnetic trip unit
- Also available as a molded case switch and as a motor circuit protector



The 3VA5: for a broad range of applications.

The 3VA6 molded case circuit breaker. Optimal for advanced applications.

- Line protection from 40A to 1000A
- Breaking capacity up to 200kA at 480V AC
- 3-pole or 4-pole versions
- Electronic trip unit
- Integrated measuring function for current, voltage, and energy values
- Optional communication via PROFIBUS, PROFINET, Ethernet (Modbus TCP), and Modbus RTU
- Easy integration into higher-level energy management and automation systems
- 100% rated versions available



The 3VA6: for demanding tasks.

One click for all information.

The new portfolio for your global challenges.

Learn more about 3VA molded case circuit breakers with UL certification in accordance with North American standards.

All information at:
usa.siemens.com/3VA

To select and order, visit:
usa.siemens.com/industrymall

Do you need more infomation about 3VA molded case circuit breakers?

Then feel free to take advantage of our comprehensive support. From planning to commissioning to operation, we're happy to help you.

Call Siemens low voltage support:
1-800-333-7421

Rittal – The System.

Faster – better – everywhere.

TS 8 Floormount Enclosure – TS 8018.804

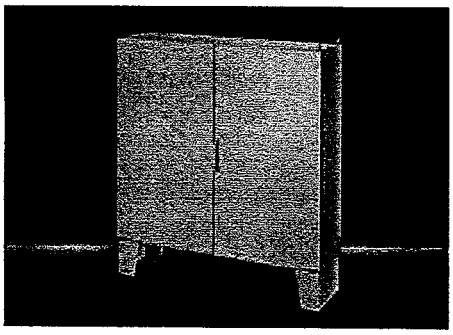
Date : Jul 21, 2020

ENCLOSURES | POWER DISTRIBUTION | CLIMATE CONTROL | IT INFRASTRUCTURE | SOFTWARE & SERVICES

FRIEDHELM LOH GROUP

TS 8 Floormount Enclosure – TS 8018.804 - TSFM716320NC

: 21.07.2020 build on www.rittal.com/ca-en



Product description

Material:	Enclosure frame: Carbon steel, 1.5 mm Roof: Carbon steel, 1.5 mm Door: Carbon steel, 2.0 mm Rear wall: carbon steel, 1.5 mm Mounting plate: Carbon steel, 3.0 mm
Surface finish:	Enclosure frame: Dipcoat-primed Door, roof and rear panel: Dipcoat-primed, powder-coated on the outside, textured paint Mounting plate and base plates: Zinc-plated
Color:	RAL 7035
Protection category IP to IEC 60 529:	IP 55
Protection category NEMA:	NEMA 12
Supply includes:	Enclosure frame with door(s) Roof plate Rear panel, detachable 4 eyebolts Padlock Comfort handle Base Plates Mounting plate 12 inch removable floor stands

Product features

Dimensions:	Height: 1800 mm (71 ") Width: 1600 mm (63 ") Depth: 500 mm (20 ")

Packaging unit:	1 pc(s).
Weight/packaging unit:	227 kg (500.4 lb.)
EAN:	84370

Approvals

Approvals:	UL + C-UL

PanelView Plus 7 Operator Interfaces

Allen-Bradley

Graphic Terminals Designed to Improve Performance

Features and Benefits

Increased Scalability

- Form factor includes sizes from 4" to 19" with wide screen options to meet a variety of application needs
- Using less than 2-inch cabinet depth saves space and reduces cost

Improved Performance

- Windows CE 6.0 standard features, including email and text notification and secure FTP server
- Embedded Ethernet ports that support device-level ring, linear or star network topologies
- Embedded PDF Viewer displays user manuals and installation guides

Mobile Enabled

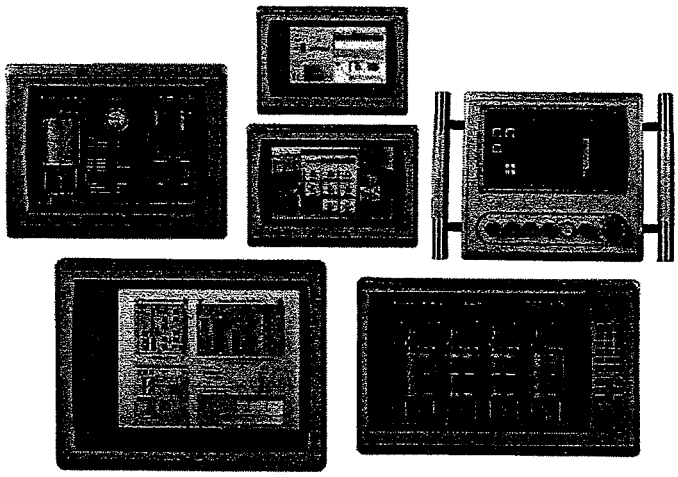
- Monitor applications from a secure remote location with VNC connectivity
- Email and texting capabilities provide real-time notifications

Enhanced Development Experience

- Faceplates and Add-on Instructions can save 50%-90% of complex screen development time
- Use an SD card to copy and restore the operator interface applications
- Increase operator productivity by creating intuitive interface with gradient shading and PNG support

Stainless Steel Terminals

- Conformal coated PC boards
- NSF certified for Food, Beverage and Pharmaceutical Industries
- Meets hygiene requirements for the Design of Meat & Poultry Processing Equipment (NSF/ ANSI/3-A 14159-1)
- Meets requirements for Special Purpose Food Equipment & Devices (NSF / ANSI 169)
- Replaceable blue food grade gasket



The PanelView™ Plus 7 operator interfaces form a comprehensive portfolio, with Standard and Performance models that provide operators at the machine level a view into the control system. The use of FactoryTalk® View Machine Edition helps simplify configuration and strengthen your Integrated Architecture solution.

The operator terminals are ideal for applications that require monitoring, controlling and displaying information in dynamic ways, where operators must quickly understand machine status and make better decisions.

Performance Models

Offered in six sizes from 7" to 19" with widescreen options, the PanelView Plus 7 Performance is designed for all applications, ranging from small to complex machines. They include high performing processors, increased memory options and embedded Ethernet ports that support device-level ring, linear, or star network topologies. Additionally, the PanelView Plus 7 Performance models include enhanced features including an RDP client that creates a thin client terminal and web browser ActiveX functionality to embed HTML pages inside the application.

Standard Models

With sizes ranging from 4" to 15", the PanelView Plus 7 Standard terminals provide basic features, ideal for small and mid-size machine applications.They include single or DLR Ethernet port options for network connectivity and ATEX Zone 2/22 certification. FactoryTalk View Machine Edition 11.0 software provides connection to one controller, up to 100 screens (50 replace and 50 on-top screens), and up to 500 alarms.

ArmorView Plus 7 Model

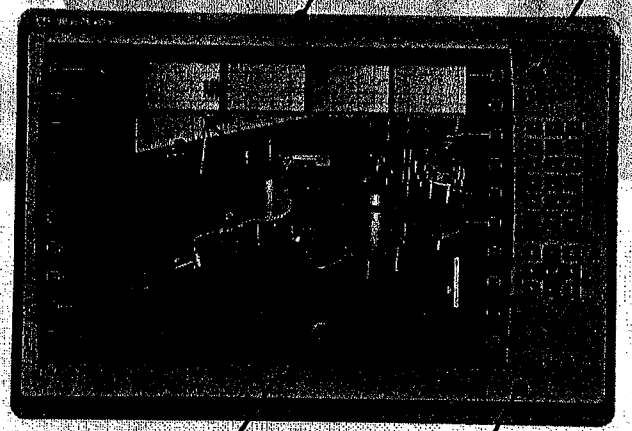
Available in a 12.1" size, the ArmorView Plus 7 graphic terminal is a fully enclosed panel. It features IP66 protection enabling a low-cost cabinet free HMI solution. Convenience features include a space and cost saving design that eliminates the need for an additional enclosure, separate push buttons, and low installation overhead. This HMI is easily connected and wiring is minimized by Ethernet I/O communication. This terminal offers options to increase flexibility, such as buttons and switches that can be individually customized to meet the needs of each machine, and orientation mount options from either a swing arm, pedestal, or fixed surface.

PanelView Plus 7 Operator Interfaces

RDP client feature creates thin client application

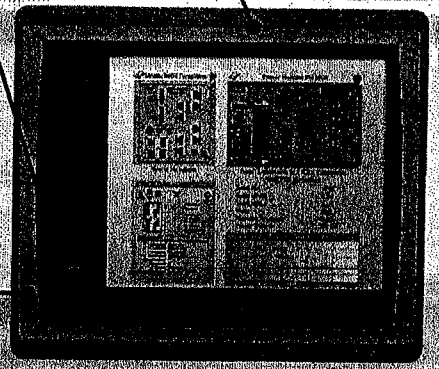
Web browser ActiveX embeds HTML pages inside application

PERFORMANCE MODEL



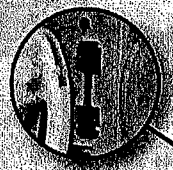
Embedded PDF Viewer shows user manuals and installation guides

Faceplates and Add-on instructions saves time on complex screen development time

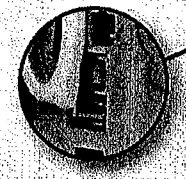


ATEX 2/22 certification

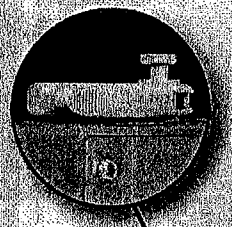
STANDARD MODEL



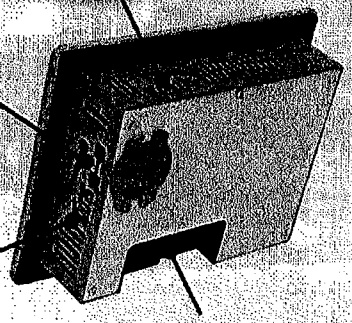
SD storage card slot for data storage, data logging, recipe management and terminal replication



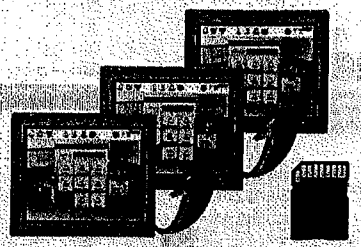
USB ports for printer, RFID reader and web camera support



New installation clamps provide fast and simple terminal installation and removal



Single or DLR-embedded Ethernet ports for connectivity in Standard terminals and embedded Ethernet port with DLR in Performance terminals

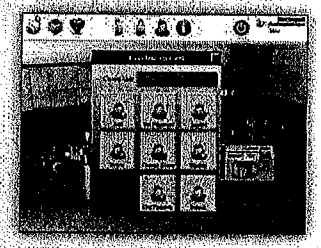


Quick and Easy Terminal Copy and Restore

Use an SD card to quickly create copies of a terminal to reduce your time to market or restore a terminal.

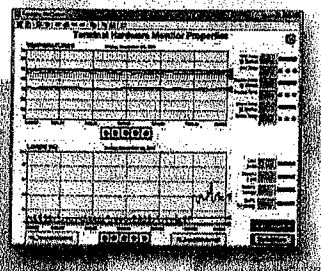
- Operating system
- Network configuration and terminal settings
- FactoryTalk® View Machine Edition (ME) runtime file
- Datalogs and Recipe files

FactoryTalk View Machine Edition



Offers simplified project maintenance with improved handling of multiple FactoryTalk View Machine Editions applications on same terminal

- Added domain authentication options
- Manages security configuration within a running application
- Includes improved audit trail
- Provides recipe management, multi-language capabilities and intuitive animations



- Fast Troubleshooting with Real Time Diagnostics
- Capture terminal environmental data at runtime such as temperature, load and battery voltage
- Mobile ready with VNC support and FactoryTalk ViewPoint

PanelView Plus 7 Standard and Performance Specifications

For up-to-date specifications, accessories, manuals and service information, visit:
http://ab.rockwellautomation.com/Graphic-Terminals

	PanelView Plus 7 Standard	PanelView Plus 7 Performance	ArmorView Plus 7
Display Size	4 inch display (110 x 135 mm) 6 inch display (152 x 176 mm) 7 inch display (170 x 212 mm) 9 inch display (190 x 280 mm) 10 inch display (252 x 297 mm) 12 inch display (240 x 340 mm) 15 inch display (318 x 381 mm)	7 inch display (170 x 212 mm) 9 inch display (190 x 280 mm) 10 inch display (252 x 297 mm) 12 inch display (240 x 340 mm) 15 inch display (318 x 381 mm) 19 inch display (411 x 485 mm)	12 inch display (240 x 340 mm) brandless only
Display Type	Color TFT LCD, 18-Bit Color Graphics		
Operating System	Microsoft Windows CE 6.0 R3		
Open Architecture	Yes		
CPU	ARM – 1.0 GHz	X86 – 1.3 GHz	
RAM	512 MB		
Internal Storage	512 MB storage, 80 MB nonvolatile storage for applications		
Real-time clock	Yes, battery-backed time clock timestamps critical data. Accuracy +/-2 minutes per month		
Environmental Operating Temperature	0...55 °C (32...131 °F)		0...45 °C (32...113 °F)
Ratings	NEMA 12, 13, 4X, IP54, IP66 Stainless steel terminals are also rated IP69 as Classified by UL and tested for IP69K according to ISO 20653		NEMA 12, 13, 4/4X*, IP66 *Configuration specific
Certifications	ATEX Zone 2, ATEX Zone 22; cULus listed; Class I, Div 2, Groups A,B,C,D, T4; Class II, Div 2, Groups F, G; Class III; Class I, Zone 2, Groups 11C T4; KCC; CE (EMC); CE (LVD); RoHS; EAC; INMETRO	cULus listed; Class I, Div 2, Groups A,B,C,D, T4; Class I, Zone 2, Groups 11C T4; KCC; CE (EMC); CE (LVD); RoHS Stainless steel terminals are also compliant with NSF / ANSI/3-A 14159-1 and NSF/ANSI 169	cULus listed; KCC; CE (EMC); CE (LVD); RoHS
Conformally Coated	–	Available for all displays	–
Stainless Steel	–	Available for 9 inch and 12 inch displays	–
SD	1 x SDHC		–
USB	1 USB-A and 1 USB-B (v2.0 high speed)	2 USB-A and 1 USB-B (v2.0 high speed)	
Ethernet	Either 1 RJ45 10/100 MB port or 2 10/100Base-T Auto MDI/MDI-X Ethernet ports that support DLR, linear or star network topologies	2 10/100Base-T, Auto MDI/MDI-X Ethernet ports that support DLR (device-level ring), linear or star network topologies	
Input Power	DC (18...30V DC)	DC (18...30V DC) and AC (100...240V AC)	DC (18...30V DC)
Standard Software	FactoryTalk Machine Edition 7.0 or later, FactoryTalk Viewpoint, PDF viewer, ActiveX controls, Remote terminal control, FTP server		

Connect with us.

AMERICAS: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444
EUROPE/MIDDLE EAST/AFRICA: Rockwell Automation NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640
ASIA PACIFIC: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

Publication 2711P-PP013I-EN-P - August 2019 | Supersedes Publication 2711P-PP013H-EN-P - March 2019

Detail Bill of Material

Project Name: Patterson MPZ
General Order No:
Negotiation No: ATI80720X0K2
Alternate No: 0000

Item No.	Qty	Product	Description
	18	PANEL BUILDERS	TYPE BAB CIRCUIT BREAKER 1P,20AMP, 120/240V,10,000

Catalog No BAB1020

Qty	List of Materials
18	TYPE BAB CIRCUIT BREAKER 1P,20AMP, 120/240V,10,000

Item No.	Qty	Product	Description
	1	Dry Type Transformers	Transformer Type: Mini Power Centers 1 Phase, 10 KVA, 1 K-Factor 480 Primary Volts 120/240 Secondary Volts Temperature Rise 115C Copper Winding Material Sound Reduction : 0 NEMA ST-20 Audible Sound Level: 50 UL Listed : Y Enclosure Type: NEMA 3R Encapsulated Operating Frequency: 60 HZ

Catalog No P48G11S1024CUB

Qty	List of Materials
1	1 Phase, 10 KVA, 480 Primary Volts, 120/240 Secondary Volts, 115C Temperature Rise, Copper Winding Material, 60 HZ
1	Transformer Lug Kit/1PH 15-37.5KVA or 3PH 15-45KVA

Eaton Selling Policy 25-000 applies.

All orders must be released for manufacture within 90 days of date of order entry. If approval drawings are required, drawings must be returned approved for release within 60 days of mailing. If drawings are not returned accordingly, and/or if shipment is delayed for any reason, the price of the order will increase by 1.0% per month or fraction thereof for the time the shipment is delayed.

Seller shall not be responsible for any failure to perform, or delay in performance of, its obligations resulting from the COVID-19 pandemic or any future epidemic, and Buyer shall not be entitled to any damages resulting thereof.

Dry-Type Transformers General Information

- Standard Transformer Catalog Number: P48G11S1024CUB
- Transformer Type: Mini Power Centers
- Phase: 1
- kVA: 10
- Primary Volts: 480
- Secondary Volts: 120/240
- Temperature Rise: 115C
- Winding Material: Copper
- Enclosure Type: NEMA 3R Encapsulated
- Frequency (Hz): 60
- Frame: 309
- Wiring Diagram: M48G11GB
- Weight (lbs.): 371
- Impedance (%): 1.96
- UL Listed: Y

Standard Values

- K-Factor: 1
- TAPS: 2@-5%
- Sound Reduction (dB): 0
- NEMA ST20 Sound Level (dB): 50
- Infrared Viewing Window: None

Field-Installed Accessories Included

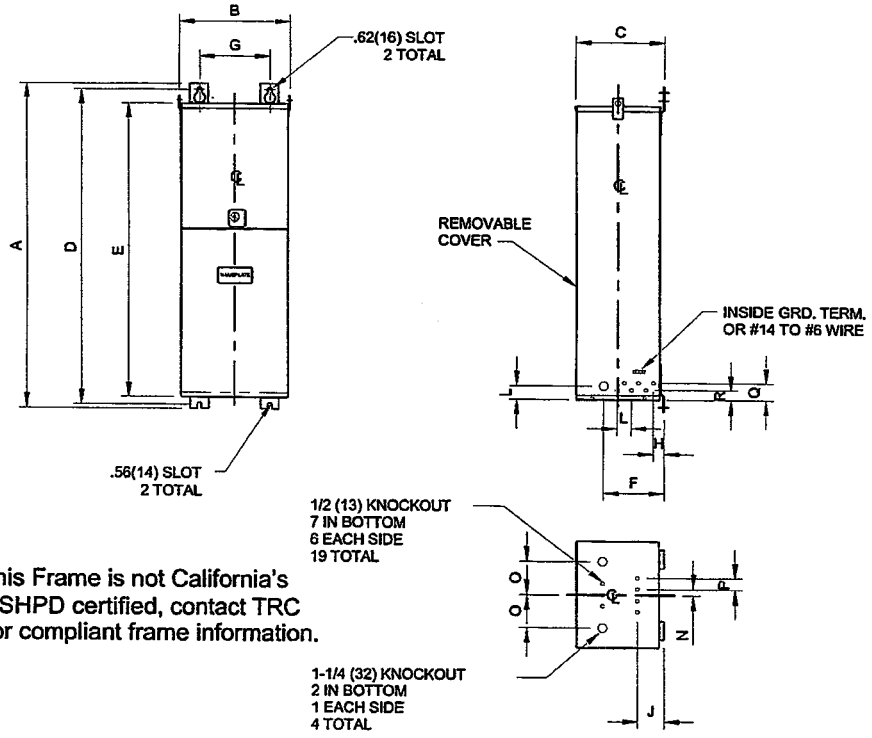
- Lug Kit: LKS1

	PREPARED BY: RACHEL HEUSSNER	DATE: 7/20/2020	Eaton		
	APPROVED BY:	DATE:	JOB NAME: Patterson MPZ		
			DESIGNATION:		
	VERSION: 1.0.0.4		TYPE: Dry-Type Transformer	DRAWING TYPE: Customer Appr.	
NEG-ALT Number: ATI80720X0K2-0000	REVISION: 0	DWG SIZE: A	G.O.	ITEM:	SHEET: 1 of 1

REFERENCE
DWG NO 7077C45H02

NOTES:

1. SINGLE PHASE MINI POWER CENTER.
2. INDOOR/OUTDOOR RATED NEMA - 3R.
3. PRIMARY MAIN CIRCUIT BREAKER(BOLT-ON) INCLUDED.
4. SECONDARY MAIN CIRCUIT BREAKER INCLUDED.
5. GROUND BAR INCLUDED.
6. FEEDER CIRCUIT BREAKERS NOT INCLUDED.
7. 180°C INSULATION CLASS.
8. COPPER WINDINGS.
9. COPPER INTERIOR.
10. PAINT COLOR ANSI #61.
11. ALL UNITS ARE DESIGNED IN ACCORDANCE WITH APPLICABLE NEMA, UL, ANSI, IEEE, AND CSA STANDARDS.
12. KO'S SHOWN ON THIS DRAWING ONLY AVAILABLE ON CARBON STEEL ENCLOSURES.



This Frame is not California's OSHPD certified, contact TRC for compliant frame information.

DIMENSIONS IN in(mm)

FRAME	A	B	C	D	E	F
FR309	43.91(1115)	14.97(380)	11.82(300)	42.60(1082)	39.67(1008)	8.07(205)
	G	H	J	L	N	O
	9.50(241)	1.47(37)	3.52(89)	1.94(49)	.75(19)	4.44(113)
				P	Q	R
				1.50(38)	2.41(61)	1.41(36)

THIS DIMENSION DRAWING IS FOR REFERENCE ONLY. IT IS NOT TO BE REGARDED AS INDICATING THE EXACT DETAILS OF CONSTRUCTION.

REV	DESCRIPTION	DFTR	APPD	DATE
05	ECO-175023	J.C.S.	A.C.	29/OCT/19
04	ECN090114	J.C.S.	C.B.	08/MAY/15
03	Agregar Leyendo OSHPD MOL074216	ANAVA	C.B.	7/23/13

REVISIONS

PRODUCT CODE: TRANSFORMER | FEDERAL ID NO.

DFTR: S.CASTRO | DATE: 05/01/04
APPD: C.ESTRADA | DATE: 05/01/04
S.O.

REVISION: 05

EATON

TITLE: DRY TYPE TRANSFORMER OUTLINE

TYPE: DRY TYPE TRANSFORMER | OUTLINE

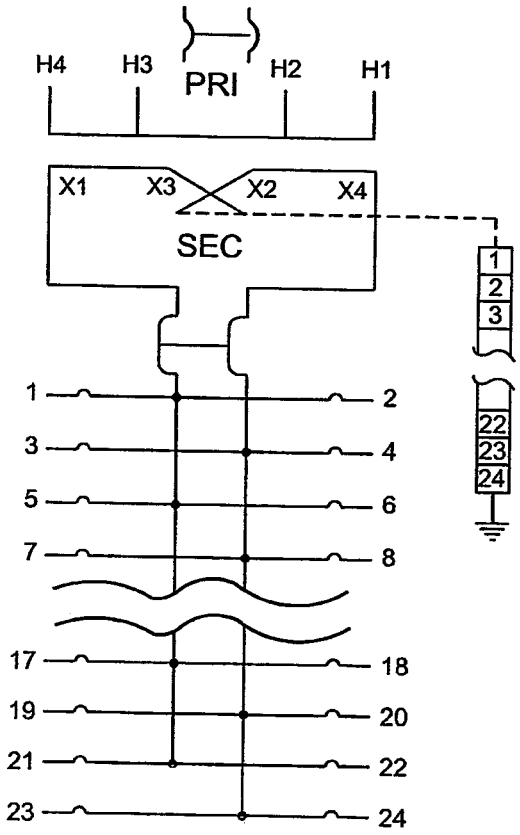
G.O.

DWG: FR309

SHEET 1 OF 01

GO/NEG-Alt-Date:	Job Name:
ATI80720X0K2-0000-7/20/2020	Patterson MPZ
Item Number:	**Catalog Number:** P48G11S1024CUB
	Designation:

WDG. DEV. ENR.	VOLTS	LINE LINEA LIGNE	CURR. CORR. COUR.
PRI	480	H1-H4	20.8
	456	H2-H4	21.9
	432	H2-H3	23.1
SEC	240	X1-X4	MAXIMUM SEC CURRENT 40 AMPS. CORRIENTE MAXIMA EN EL SEC 40 AMPS. COURANT SEC MAXIMAL 40 A
	240/120	X1-X3-X4	



PRODUCT CODE: OL	FEDERAL ID NO.

REV	DESCRIPTION	DFTR	APPD	DATE

REVISIONS

DFTR	E. CARDENAS	DATE MAY/17/2018
APPD	A. SANDOVAL	DATE MAY/17/2018
S.O.		
REVISION	01	

EATON

TITLE: DRY TYPE TRANSFORMER
TRANSFORMER WIRING DIAGRAM #M48G11GB

TYPE: TRANSFORMER

C.O.

DWG: M48G11GB

SHEET 1 OF 01

GO/NEG-Alt-Date: ATI80720X0K2-0000-7/20/2020		Job Name: Patterson MPZ
Item Number:	Catalog Number: P48G11S1024CUB	Designation:

CompactLogix™ 5370 L3 Programmable Automation Controllers

Allen-Bradley
by ROCKWELL AUTOMATION

1769-L30ER, -L30ERM, -L30ER-NSE, -L33ER, -L33ERM, L36ERM, -L37ERM, -L38ERM

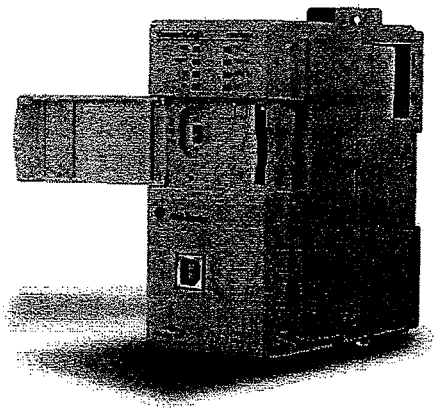
Features and Benefits

The CompactLogix 5370 L3 controllers deliver scalable, affordable control ideal for applications from small stand-alone equipment to high performance indexing tables, process skids, case packers and erectors, and packaging.

Machine builders and end users can take advantage of the cost-saving features of these controllers:

- Support for Integrated Motion on EtherNet/IP
- Support for Device Level Ring (DLR) network topologies
- Built-in energy storage eliminates the need for lithium batteries
- Support reuse of existing 1769 I/O
- Removable 1GB secure digital (SD) card improves data integrity
- Flexible memory options up to 3MB
- Added features for hazardous environments (NSE version)
- Support for Kinematics eliminates the need for additional robot controllers and software
- Open socket capability allows support for Modbus TCP as well as devices such as printers, barcode readers and servers

Reduce cost and time to market with CompactLogix 5370 L3 Programmable Automation Controllers.



Expanding on the scalability of the Logix family of controllers, the CompactLogix 5370 L3 programmable automation controllers (PAC) are designed to meet the growing need for a higher performance controller in a compact and affordable package.

As part of the Integrated Architecture system, the CompactLogix 5370 L3 controllers use the same programming software, network protocol, and information capabilities as all Logix controllers, providing a common development environment for all control disciplines.

Integrated Motion on EtherNet/IP

The CompactLogix 5370 L3 controller provides a strong motion solution for customers looking for performance and cost competitiveness.

- Supports up to 16 axes of integrated motion
- Together with the Kinetix 350, offers cost-effective, scalable motion solution

Network Capabilities

With dual Ethernet ports and an integrated Ethernet switch, these controllers now support Device Level Ring (DLR) network topologies, simplifying integration of components in your control system and reducing system cost:

- Provides resiliency from loss of one network connection
- Allows replacement of devices one at a time without stopping production
- Reduces the number of Ethernet switches in the control system

Features for Hazardous Environments

The No Stored Energy (NSE) version of the CompactLogix 5370 L3 offers additional features for hazardous environments found in industries such as mining and oil and gas.

- Allows safe transport of controller in and out of mining areas
- Powered down controller has less than 200uJ of residual energy stored in each component
- No consequences of arc or spark to cause an explosion in gaseous environment

Rockwell Automation

CompactLogix 5370 L3 Controller Product Specifications

	1769-L30ER	1769-L30ERM	1769-L30ER-NSE	1769-L33ER	1769-L33ERM	1769-L36ERM	1769-L37ERM	1769-L38ERM
User Memory	1 MB	1 MB	1 MB	2 MB	2 MB	3 MB	4 MB	5 MB
Controller Tasks	32	32	32	32	32	32	32	32
Programs per Task	100	100	100	100	100	100	100	100
Integrated Motion	--	4 axis CIP motion position loop axis	--	--	8 axis CIP motion position loop axis	16 axis CIP motion position loop axis		
Package Size	55mm wide x 118mm high x 105mm deep							
Certifications	cULH (Class I Division 2), KCC / UL (UL 508), ULH (Class I & II, Division 2 and Class III, Divisions 1 & 2) / ATEX, CE, C-Tick, GOST-R and Marine							
Local Expansion Modules	8	8	8	16	16	30	30	30
Local Expansion I/O Points (Max)	256	256	256	512	512	960	960	960
Communication Module Additions	DeviceNet with 1769-SDN or 3rd party							
Flash Memory Card	Industrially rated and certified Secure Digital (SD) memory card (1 and 2 GB options); all controllers shipped with 1 GB card							
Servo Drives (Position Loop CIP)	--	4	--	--	8	16	16	16
Ethernet I/O IP Nodes	16	16	16	32	32	48	48	48
Virtual Axes	100	100	100	100	100	100	100	100
Feedback only, Torque, Velocity, Vhz (max CIP Motion Drives)	--	16	--	--	32	48	48	48
Axes/ms	--	2	--	--	2	2	2	2
Kinematics Support	--	yes	--	--	yes	yes	yes	yes
Software / Firmware	RSLogix 5000 V20 and RSLinx Classic V2.59 Firmware v20.1x or later						RSLogix 5000 V31 and RSLinx Classic V4.0 Firmware v31.x or later	
Conformally Coated Product Available	1769-L30ERK	1769-L30ERMK	no	1769-L33ERK	1769-L33ERMK	no	1769-L37ERMK	1769-L38ERMK

Connect with us.

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ASIA PACIFIC: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

Publication 1769-PP010C-EN-E – November 2019 | Supersedes Publication 1769-PP010B-EN-E – January 2013

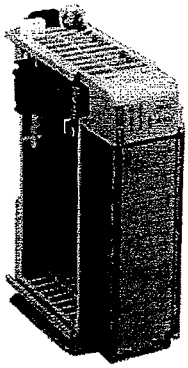
Technical Data

Original Instructions

Allen-Bradley

1769 Compact I/O Modules Specifications

1769 Series Catalog Numbers



The 1769 Compact I/O™ modules can be used in these applications:

- With a 1769 CompactLogix™ controller
- For expansion I/O in a MicroLogix™ 1500 controller assembly
- In an assembly with a 1769-ADN DeviceNet adapter
- In an assembly with a 1769-AENTR Ethernet adapter.

Unless connected to a MicroLogix 1500 base, each bank of I/O modules must include its own power supply.

Install the I/O modules on a panel with two mounting screws or on a DIN rail. The modules mechanically lock together with a tongue-and-groove design and have an integrated communication bus that is connected from module to module by a movable bus connector.

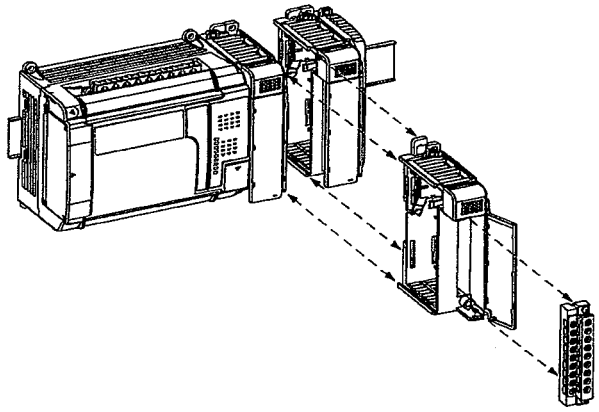
Summary of Changes

This manual contains new and updated information.

Topic	Pages
Added to each catalog number a reference to Environmental Specifications - 1769 Compact I/O Modules on page 3	Throughout
Updated certifications on most modules	Throughout
Corrected the reference to a replacement door in the 1769-IF8, 1769-IQ32, 1769-OA16, and 1769-OB32 module technical specifications	28 45 65 76
Updated the Slot width specification for the 1769-OA16 module to the correct value	64
Removed the reference to an optional 24V DC Class 2 power supply in the 1769-OF4 module specifications	83
Added Catalog Number Explanation	129

I/O Module Overview

Each I/O module includes a built-in removable terminal block with finger-safe cover for connections to I/O sensors and actuators. The terminal block is behind a door at the front of the module. I/O wiring can be routed from beneath the module to the I/O terminals.



- Once the modules are locked together, the system becomes a rugged assembly.
- Upper and lower tongue-and-groove slots guide the module during installation and secure the module within the system.
- Removable terminal blocks help ease the wiring task.
- Self-lifting, field-wire pressure plates cut installation time.
- The patented bus connector with the lock function enables consistent and system communication.
- A color bar is provided on the front of the module.
- Digital and field circuits are optically isolated.

Available 1769 Compact I/O Modules

I/O Type	Cat. No.	Page	Cat. No.	Page
AC digital	1769-IA8I 1769-IA16 1769-IM12	7 9 38	1769-OA8 1769-OA16	61 64
DC digital	1769-IG16 1769-IQ16 1769-IQ16F 1769-IQ32 1769-IQ32T 1769-IQ6XOW4	36 40 42 44 46 48	1769-OB8 1769-OB16 1769-OB16P 1769-OB32 1769-OB32T 1769-OG16 1769-OV16 1769-OV32T	67 69 72 75 78 98 100 103
Contact	1769-OW8 1769-OW8I	105 107	1769-OW16	109
Analog	1769-IF4 1769-IF4I 1769-IF4XOF2 1769-IF4FXOF2F 1769-IF8 1769-IF16C 1769-IF16V 1769-IR6 1769-IT6	11 14 17 21 26 30 33 51 57	1769-OF2 1769-OF4 1769-OF4CI 1769-OF4VI 1769-OF8C 1769-OF8V	80 83 86 89 92 95
Specialty	1769-ARM 1769-ASCII	111 112	1769-BOOLEAN 1769-HSC	114 118

Environmental Specifications - 1769 Compact I/O Modules

Attribute	1769-IA8I, 1769-IA16, 1769-IM12, 1769-OA8, 1769-OA16, 1769-IQ16, 1769-IQ16F, 1769-IQ32, 1769-IQ6XOW4, 1769-OB8, 1769-OB16, 1769-OB16P, 1769-OB32, 1769-OV16, 1769-OW8, 1769-OW8I, 1769-OW16 1769-IF4, 1769-IF4XOF2, 1769-IR6, 1769-IT6 1769-ARM, 1756-HSC	1769-IG16, 1769-IQ32T, 1769-OB32T, 1769-OG16, 1769-OV32T 1769-IF4I, 1769-IF8, 1769-IF16C, 1769-IF16V, 1769-OF2, 1769-OF4CI, 1769-OF4VI, 1769-OF8C, 1769-OF8V, 1769-IF4FXOF2F 1769-ASCII, 1769-BOOLEAN
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)	
Temperature, storage IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)	
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Nonoperating Damp Heat)	5...95% noncondensing	
Vibration IEC 60068-2-6 (Test Fc, Operating)	Operating: 5 g @ 10...500 Hz Relay operating: 2 g	5 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	Panel mount 30 g DIN rail mount 20 g	
Shock, relay operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	Panel mount 7.5 g DIN rail mount 5 g	—
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	Panel mount 40 g DIN rail mount 30 g	

Place Compact I/O Modules

You can DIN-rail or panel mount the controller and I/O modules. The number of local I/O modules that are supported depends on the controller.

Controller	Supports	Location	Considerations
1769-L24ER-QB1B 1769-L24ER-QBFC1B 1769-L27ERM-QBFC1B	4 local modules	Right side of the controller	The additional modules are connected directly to the controller. There are no additional banks of local I/O.
1769-L30ER 1769-L30ERM 1769-L30ER-NSE	8 local modules	1 separate bank	Standard 1769 power supplies power the additional banks and connect to the main rack by using standard 1769 expansion cables.
1769-L33ER 1769-L33ERM	16 local modules	2 separate banks	
1769-L36ERM	30 local modules	3 separate banks	
1769-L23E-QB1B 1769-L23E-QBFC1B 1769-L23-QBFC1B	2 local modules, V17 and earlier.	Right side of the packaged controller	The additional modules are connected directly to the packaged controller. There are no additional banks of local I/O.
1769-L23E-QB1B	3 local modules, v18 and later.		
1769-L35CR 1769-L35E	30 local modules	3 separate banks	Standard 1769 power supplies power the additional banks and connect to the main rack by using standard 1769 expansion cables.
1769-L32C 1769-L32E 1769-L31	16 local modules	3 separate banks	
1768-L43	16 local modules	3 separate banks	As many as eight 1769 local modules can be attached to the 1768 backplane. The remaining modules can be in one or two additional I/O banks. Standard 1769 power supplies power the additional banks and connect to the main rack by using standard 1769 expansion cables.
1768-L45	30 local modules	3 separate banks	

Each 1769 Compact I/O module has a distance rating. In 1769 systems, the distance rating is the number of modules between the specific module and the 1769 power supply. In a 1768 system, the distance rating is the number of modules between the specific I/O module and the 1768 controller.

Digital I/O Modules

Choose digital I/O modules when you need these features.

Type	Description
Input	An input module responds to an input signal in this manner: • Input filtering limits the effect of voltage transients that contact bounce and/or electrical noise cause. If not filtered, voltage transients could produce false data. All input modules use input filtering. • Optical isolation shields logic circuits from possible damage due to electrical transients. • Logic circuits process the signal. • An input indicator turns on or off, which indicates the status of the corresponding input device.
Output	An output module controls the output signal in this manner: • Logic circuits determine the output status. • An output indicator displays the status of the output signal. • Optical isolation separates module logic and bus circuits from field power. • The output driver turns the corresponding output on or off.

Most output modules have built-in surge suppression to reduce the effects of high-voltage transients. Use an additional suppression device if an output is being used to control inductive devices, such as relays, motor starters, solenoids, or motors.

Additional suppression is especially important if your inductive device is in series with or parallel to hard contacts, such as push buttons or selector switches. Add a suppression device directly across the coil of an inductive device. The suppression device reduces the effects of voltage transients that are caused by interrupting the current to that device and to prolong the life of the switch contacts.

Analog I/O Modules

Choose analog, thermocouple, or RTD modules for these features:

- Individually configurable channels
- Ability to enable and disable channels individually
- Onboard scaling
- Auto calibration of inputs
- Online configuration
- Selectable input filters
- Over-range and under-range detection and indication
- Selectable response to a broken input sensor
- Selectable power source
- Input modules offer both single-ended or differential inputs
- Ability to direct output device operation during an abnormal condition
- High accuracy ratings

The data can be configured on board each module as:

- Engineering Units in volts or milliamps.
- Scaled-for-PID.
- Percent of range.
- Raw/Proportional Data for maximum resolution.

Specialty I/O Modules

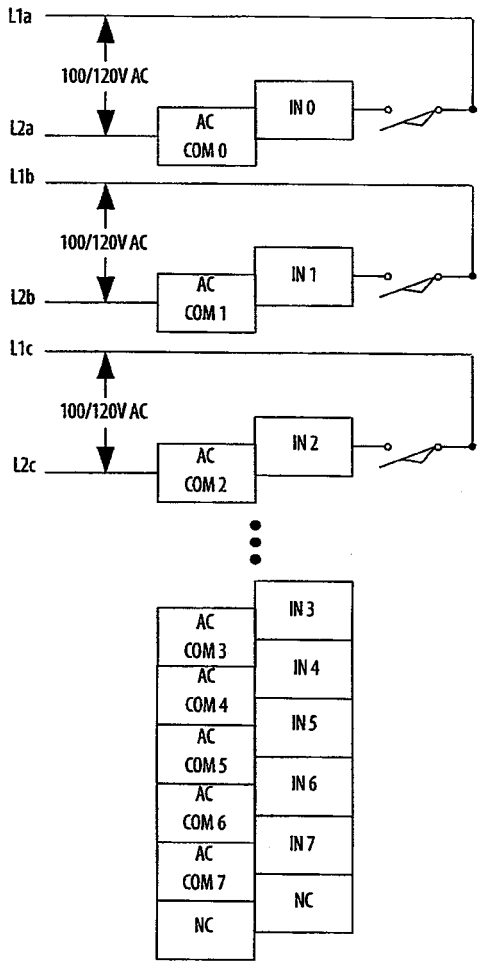
These specialty modules are available.

Cat. No.	Description
1769-ARM	Use a 1769-ARM address reserve module to reserve module slots. To use the 1769-ARM module, first you create an I/O configuration and user program. Then you can remove and replace any module in the system with a 1769-ARM module after you inhibit the removed module in the programming software.
1769-ASCII	The 1769-ASCII module, a general-purpose two-channel ASCII interface, provides a flexible network interface to a wide variety of RS-232, RS-485, and RS-422 ASCII devices. The module provides the communication connections to the ASCII device.
1769-BOOLEAN	Use the 1769-BOOLEAN module in applications that require repeatability, such as material handling and packaging, when there is a requirement to activate an output that is based on the transition of an input. If the Boolean expression is true, the output is directed to the ON state. If the Boolean expression is false, the output channel is directed to the OFF state. There are four operators that you can configure as OR, AND, XOR, or none.
1769-HSC	Use the 1769-HSC module when you need: • A counter module that can react to high-speed input signals. • To generate rate and time-between-pulses (pulse interval) data. • One or two channels of quadrature or four channels of pulse/count inputs.
1769-SM1	The Compact I/O to DPI/SCANport module connects to PowerFlex® 7-class drives, other DPI-based host devices, and SCANport™-based host devices such as 1305 and 1336 PLUS™ II drives.
1769-SM2	The Compact I/O to DSI/Modbus module connects to PowerFlex 4-class drives and to other Modbus RTU slave devices, such as PowerFlex 7-class drives with 20-COMM-H RS-485 HVAC adapters.

1769-IA8I

Compact individually isolated 120V AC input module

1769-IA8I



Technical Specifications - 1769-IA8I

Attribute	1769-IA8I
Inputs	8 individually isolated
Voltage category	100/120V AC
Operating voltage range	79...132V AC, 47...63 Hz
Input delay, on	20 ms
Input delay, off	20 ms
Current draw @ 5.1V	90 mA
Heat dissipation, max	1.81 W
Off-state voltage, max	20V AC
Off-state current, max	2.5 mA
On-state voltage, min	79V AC
On-state current, min	5 mA @ 74V AC

Technical Specifications - 1769-IA8I

Attribute	1769-IA8I
On-state current, max	12 mA @ 120V AC
Inrush current, max[1]	250 mA
Input impedance, max	12 kΩ @ 50 Hz 10 kΩ @ 60 Hz
Isolation voltage	Verified by one of these dielectric tests: 1517V AC for 1 s or 2145V DC for 1 s, input point to bus and group to group 132V AC working voltage (IEC Class II reinforced insulation)
Weight, approx	270 g (0.60 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
IEC input compatibility	Type 1+
Replacement terminal block	1769-RTBN18 (1 per kit)
Replacement door label	1769-RL1 (2 per kit)
Replacement door	1769-RD (2 per kit)
Vendor ID code	1
Product type code	7
Product code	81
Enclosure type rating	None (open-style)

(1) A current limiting resistor can be used to limit inrush current; however, the operating characteristics of the AC input circuit are affected. If a 6.8 kΩ (2.5 W minimum) resistor is placed in series with the input, the inrush current is reduced to 35 mA. In this configuration, the minimum on-state voltage increases to 92V AC. Before adding the resistor in a hazardous environment, be sure to consider the operating temperature of the resistor and the temperature limits of the environment. The operating temperature of the resistor must remain below the temperature limit of the environment.

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

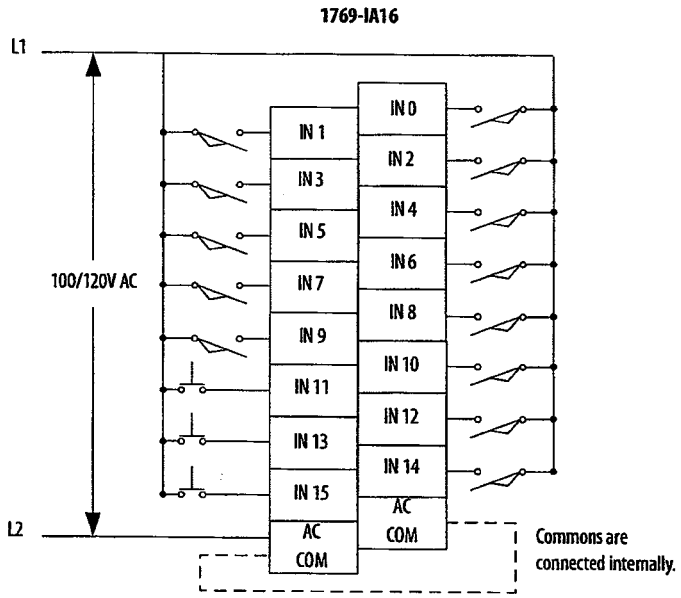
Certifications - 1769-IA8I

Certification[1]	1769-IA8I
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions European Union 2014/35/EU LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

1769-IA16

Compact 120V AC input module



Technical Specifications - 1769-IA16

Attribute	1769-IA16
Inputs	16 (16 points/group, internally connected commons)
Voltage category	100/120V AC
Operating voltage range	79...132V AC, 47...63 Hz
Input delay, on	20 ms
Input delay, off	20 ms
Current draw @ 5.1V	115 mA
Heat dissipation, max	3.30 W
Off-state voltage, max	20V AC
Off-state current, max	2.5 mA
On-state voltage, min	79V AC
On-state current, min	5 mA @ 74V AC
On-state current, max	12 mA @ 120V AC
Inrush current, max(1)	250 mA
Input impedance, max	12 kΩ @ 50 Hz 10 kΩ @ 60 Hz
Isolation voltage	Verified by one of these dielectric tests: 1517V AC for 1 s or 2145V DC for 1 s, input point to bus 132V AC working voltage (IEC Class II reinforced insulation)
Weight, approx	280 g (0.61 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount

Technical Specifications - 1769-IA16

Attribute	1769-IA16
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
IEC input compatibility	Type 1+
Replacement terminal block	1769-RTBN18 (1 per kit)
Replacement door label	1769-RL1 (2 per kit)
Replacement door	1769-RD (2 per kit)
Vendor ID code	1
Product type code	7
Product code	82
Enclosure type rating	None (open-style)

(1) A current limiting resistor can be used to limit inrush current; however, the operating characteristics of the AC input circuit are affected. If a 6.8 kΩ (2.5 W minimum) resistor is placed in series with the input, the inrush current is reduced to 35 mA. In this configuration, the minimum on-state voltage increases to 92V AC. Before adding the resistor in a hazardous environment, be sure to consider the operating temperature of the resistor and the temperature limits of the environment. The operating temperature of the resistor must remain below the temperature limit of the environment.

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

Certifications - 1769-IA16

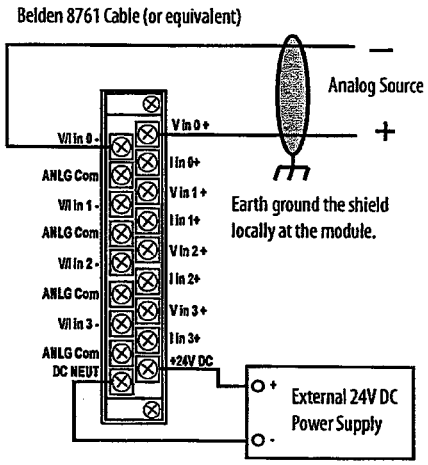
Certification[1]	1769-IA16
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions European Union 2014/35/EU LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

1769-IF4

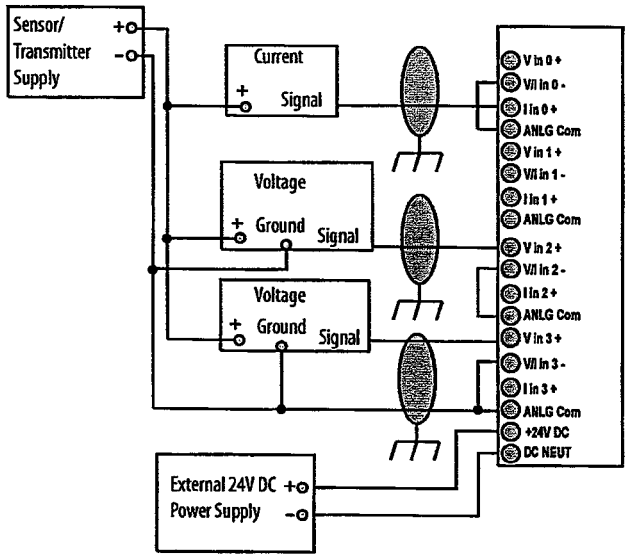
Compact voltage/current analog input module

1769-IF4 Differential Inputs

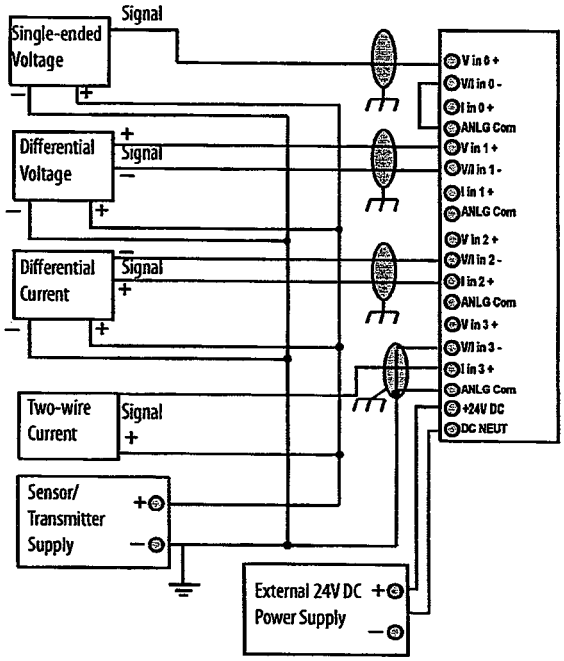


The external power supply must be rated Class 2, with a 24V DC range of 20.4...26.4V DC and 60 mA minimum. Series B and later modules support this option.

1769-IF4 Single-ended Sensor/Transmitter Inputs



1769-IF4 Mixed Transmitter Inputs



Technical Specifications - 1769-IF4

Attribute	1769-IF4
Inputs	4 differential or single-ended
Input range	±10V 0...10V 0...5V 1...5V 0...20 mA 4...20 mA
Full scale range[1]	±10.5V -0.5...10.5V -0.5...5.25V 0.5...5.25V 0...21 mA 3.2...21 mA
Current draw @ 5.1V	120 mA
Current draw @ 24V	60 mA
Heat dissipation, max	2.52 W
Converter type	Delta Sigma
Resolution[2]	14 bits (unipolar) 14 bits plus sign (bipolar)
Rated working voltage[3]	30V AC/30V DC
Common mode voltage range[4]	±10V DC max per channel
Common mode rejection	> 60 dB @ 50 and 60 Hz with the 50 or 60 Hz filter selected, respectively
Normal mode rejection ratio	-50 dB @ 50 and 60 Hz with the 50 or 60 Hz filter selected, respectively
Input impedance	Voltage: 220 kΩ Current: 250 Ω
Accuracy[5]	Voltage: ±0.2% full scale @ 25 °C (77 °F) Current: ±0.35% full scale @ 25 °C (77 °F)
Accuracy drift with temperature	Voltage: ±0.003% per °C Current: ±0.0045% per °C
Nonlinearity	±0.03%
Repeatability[6]	±0.03%
Module error	Voltage: ±0.3% Current: ±0.5%
Overload at input terminals, max[7]	Voltage: ±30V DC continuous, 0.1 mA Current: ±32 mA continuous, ±7.6V DC
Isolation voltage	500V AC or 710V DC for 1 minute (qualification test), group to bus 30V AC/30V DC working voltage (IEC Class II(IEC Class II reinforced insulation)
Weight, approx	300 g (0.65 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Optional 24V DC Class 2 power supply voltage range[8]	20.4...26.4V DC
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)

Technical Specifications - 1769-IF4

Attribute	1769-IF4
Replacement terminal block	1769-RTBN18 (1 per kit)
Replacement door label	1769-RL2 series B (2 per kit)
Replacement door	1769-RD (2 per kit)
Vendor ID code	1
Product type code	10
Product code	35
Enclosure type rating	None (open-style)

(1) The over- or under-range flag comes on when the normal operating range (over/under) is exceeded. The module continues to convert the analog input up to the maximum full scale range. The flag automatically resets when within the normal operating range.
(2) Resolution is dependent upon your filter selection. The maximum resolution is achieved with either the 50 or 60 Hz filter selected.
(3) Rated working voltage is the maximum continuous voltage that can be applied at the input terminal, including the input signal and the value that floats above ground potential. For example, a 10V DC input signal and 20V DC potential above ground at the input terminals.
(4) For proper operation, both the plus and minus input terminals must be within ±10V DC of analog common.
(5) Includes offset, gain, nonlinearity, and repeatability error terms.
(6) Repeatability is the ability of the input module to register the same reading in successive measurements for the same input signal.
(7) Damage can occur to the input circuit if this value is exceeded.
(8) If the optional 24V DC Class 2 power supply is used, the 24V DC current draw from the bus is 0 mA.

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

Response Speed - 1769-IF4

Filter Frequency	Cutoff Frequency	Step Response	Channel Update
50 Hz	13.1 Hz	60 ms	22 ms
60 Hz	15.7 Hz	50 ms	19 ms
250 Hz	65.5 Hz	12 ms	6 ms
500 Hz	131 Hz	6 ms	4 ms

Certifications - 1769-IF4

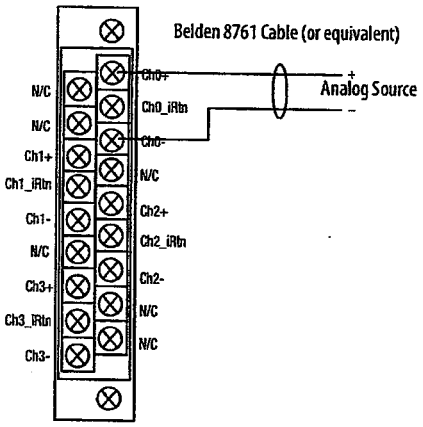
Certification[1]	1769-IF4
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

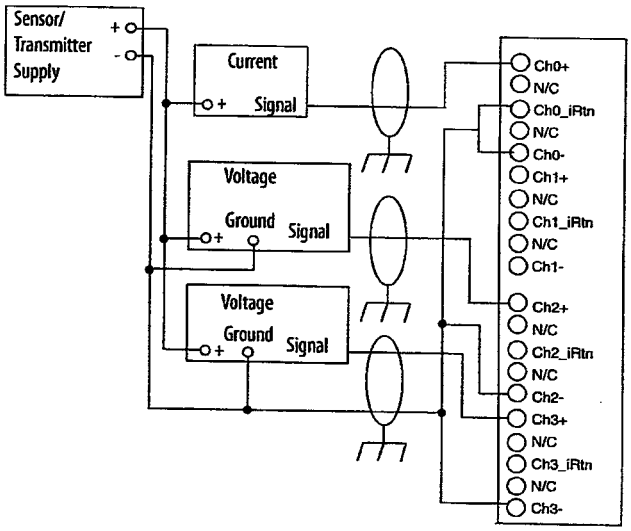
1769-IF4I

Compact voltage/current analog, individually isolated input module

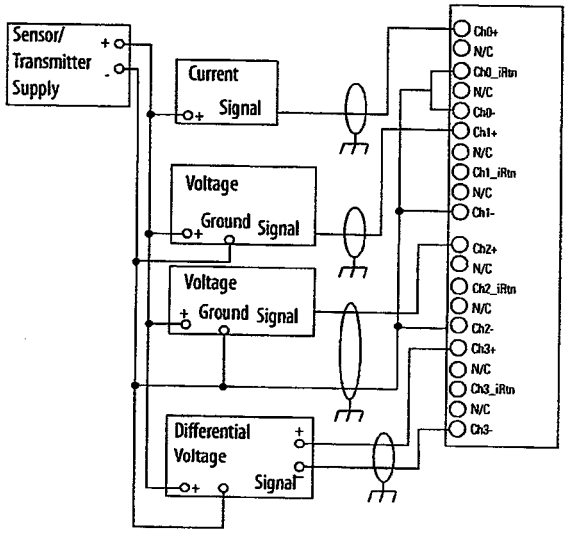
1769-IF4I Differential Inputs



1769-IF4I Single-ended Sensor/Transmitter Inputs



1769-IF4I Mixed Transmitter Inputs



Technical Specifications - 1769-IF4I

Attribute	1769-IF4I
Inputs	4 isolated differential
Input range	±10V 0…10V 0…5V 1…5V 0…20 mA 4…20 mA
Full scale range[1]	±10.5V -0.5…10.5V -0.5…5.25V 0.5…5.25V 0…21 mA 3.2…21 mA
Bus current draw	5V DC, 140 mA 24V DC, 110 mA
Heat dissipation, max	3.0 W
Converter type	Delta Sigma
Resolution [2]	16 bits (unipolar) 15 bits plus sign (bipolar)
Rated working voltage[3]	30V AC/30V DC
Common mode voltage range[4]	±10V DC max per channel
Common mode rejection	> 60 dB @ 50 and 60 Hz with the 10 Hz filter selected
Normal mode rejection ratio	-50 dB @ 50 and 60 Hz with the 10 Hz filter selected
Input impedance	Voltage: 1 MΩ Current: 249 Ω
Accuracy[5]	Voltage: ±0.2% full scale @ 25 °C (77 °F) Current: ±0.35% full scale @ 25 °C (77 °F)
Accuracy drift with temperature	Voltage: ±0.003% per °C Current: ±0.0045% per °C
Nonlinearity	±0.03%
Repeatability[6]	±0.03%
Module error	Voltage: ±0.3% Current: ±0.5%
Overload at input terminals, max[7]	Voltage: ±24V DC continuous, 0.1 mA Current: ±28 mA continuous, ±7.6V DC
Isolation voltage	500V AC or 710V DC for 1 minute (qualification test), group to bus 30V AC/30V DC working voltage (IEC Class II reinforced insulation) 500V AC or 710V DC for 1 minute or 250V continuous (optical and magnetic), channel to rack and channel to channel
Weight, approx	300 g (0.65 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22…14 AWG) solid (22…16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
Replacement terminal block	1769-RTBN18 (1 per kit)

Technical Specifications - 1769-IF4I

Attribute	1769-IF4I
Replacement door label	1769-RL2 series B (2 per kit)
Replacement door	1769-RD (2 per kit)
Vendor ID code	1
Product type code	10
Product code	44
Enclosure type rating	None (open-style)

(1) The over- or under-range flag comes on when the normal operating range (over/under) is exceeded. The module continues to convert the analog input up to the maximum full scale range. The flag automatically resets when within the normal operating range.
(2) Resolution is dependent upon your filter selection. The maximum resolution is achieved with either the 50 or 60 Hz filter selected.
(3) Rated working voltage is the maximum continuous voltage that can be applied at the input terminal, including the input signal and the value that floats above ground potential. For example, a 10V DC input signal and 20V DC potential above ground at the input terminal.
(4) For proper operation, both the plus and minus input terminals must be within ±10V DC of analog common.
(5) Includes offset, gain, nonlinearity, and repeatability error terms.
(6) Repeatability is the ability of the input module to register the same reading in successive measurements for the same input signal.
(7) Damage can occur to the input circuit if this value is exceeded.

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

Response Speed - 1769-IF4I

Filter Frequency	Channel Update
28.5 Hz	108 ms
50 Hz	62 ms
60 Hz	52 ms
300 Hz	12 ms
360 Hz	10 ms

Certifications - 1769-IF4I

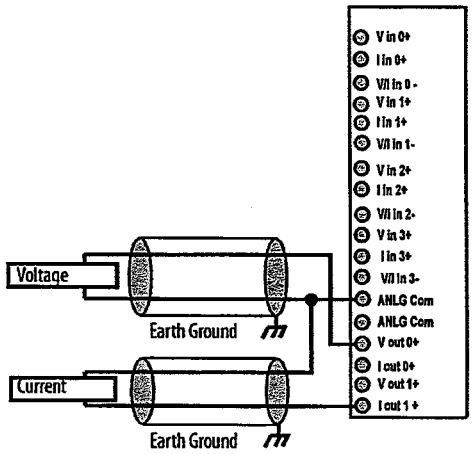
Certification[1]	1769-IF4I
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E194810. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

1769-IF4XOF2

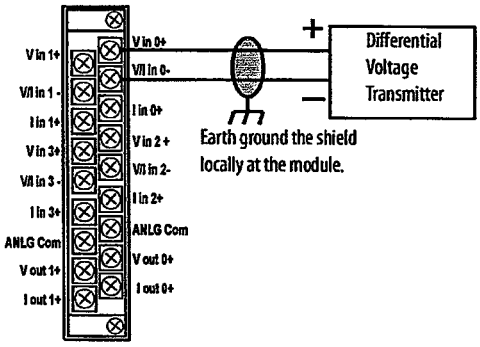
Compact combination input/output analog module

1769-IF4XOF2 Outputs

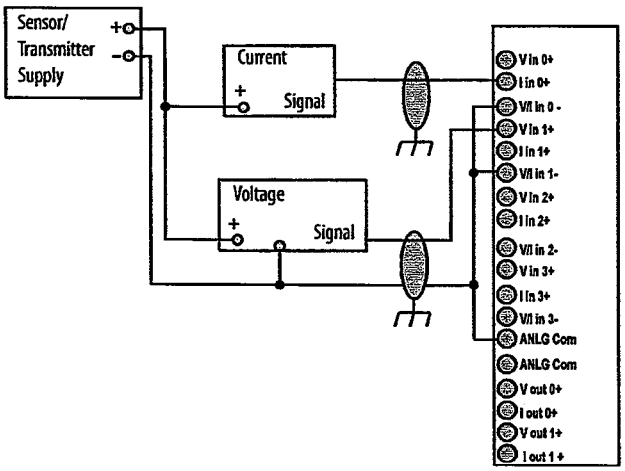


1769-IF4XOF2 Differential Inputs

Belden 8761 Cable (or equivalent)

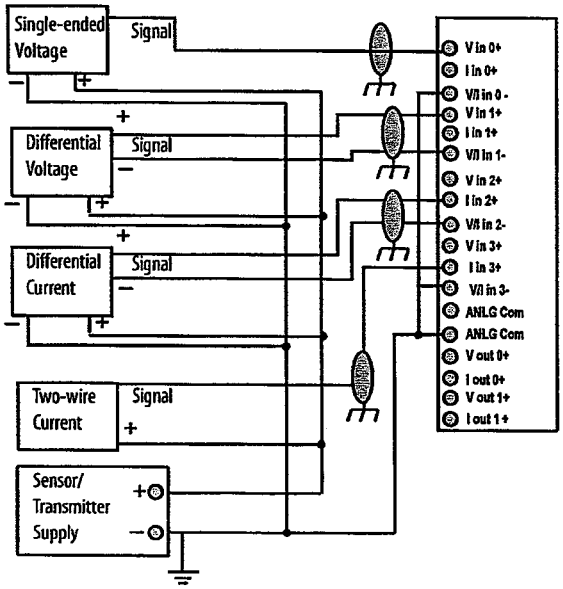


1769-IF4XOF2 Single-ended Sensor/Transmitter Inputs



The sensor power supply must be rated Class 2.

1769-IF4XOF2 Mixed Transmitter Inputs



Technical Specifications - 1769-IF4XOF2

Attribute	1769-IF4XOF2
Current draw @ 5.1V	120 mA
Current draw @ 24V	160 mA
Heat dissipation, max	3.03 W
Weight, approx	290 g (0.64 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
Replacement terminal block	1769-RTBN18 (1 per kit)
Replacement door label	1769-RL2 series B (2 per kit)
Replacement door	1769-RD (2 per kit)
Vendor ID code	1
Product type code	10
Product code	33
Enclosure type rating	None (open-style)

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

1769-IF4XOF2 Input Specifications

Attribute	1769-IF4XOF2
Inputs	4 differential or single-ended
Input range	0...10V 0...20 mA
Full scale range[1]	0...10.5V 0...21 mA
Converter type	Successive approximation
Resolution[2]	8 bits plus sign
Response speed per channel	5 ms
Rated working voltage[3]	30V AC/30V DC
Common mode voltage range[4]	10V DC max per channel
Common mode rejection	> 60 dB @ 50 and 60 Hz with the 10 Hz filter selected
Input impedance	Current: 150 Ω Voltage: 150 kΩ
Accuracy[5]	Current: ±0.6% full scale @ 25 °C (77 °F) Voltage: ±0.7% full scale @ 25 °C (77 °F)
Overall accuracy	Current: ±0.8% full scale @ 0...60 °C (32...140 °F) Voltage: ±0.9% full scale @ 0...60 °C (32...140 °F)
Accuracy drift with temperature	Current: ±0.006% per °C Voltage: ±0.006% per °C

1769-IF4XOF2 Input Specifications

Attribute	1769-IF4XOF2
Nonlinearity	±0.4%
Repeatability[6]	±0.4%
Overload at input terminals, max[7]	Current: ±32 mA continuous, ±5V DC Voltage: ±20V DC continuous, 0.1 mA
Isolation voltage	500V AC or 710V DC for 1 minute (qualification test), group to bus 30V AC/30V DC working voltage (IEC Class II reinforced insulation)

(1) The over- or under-range flag comes on when the normal operating range (over/under) is exceeded. The module continues to convert the analog input up to the maximum full scale range. The flag automatically resets when within the normal operating range.
(2) Resolution is dependent upon your filter selection. The maximum resolution is achieved with either the 50 or 60 Hz filter selected.
(3) Rated working voltage is the maximum continuous voltage that can be applied at the input terminal, including the input signal and the value that floats above ground potential. For example, a 10V DC input signal and 20V DC potential above ground at the input terminal.
(4) For proper operation, both the plus and minus input terminals must be within ±10V DC of analog common.
(5) Includes offset, gain, nonlinearity, and repeatability error terms.
(6) Repeatability is the ability of the input module to register the same reading in successive measurements for the same input signal.
(7) Damage can occur to the input circuit if this value is exceeded.

1769-IF4XOF2 Output Specifications

Attribute	1769-IF4XOF2
Outputs	2 single-ended
Output range	0...10V 0...20 mA
Full scale range[1]	0...10.5V 0...21 mA
Converter type	Resistor string
Resolution	8 bits plus sign
Response speed per channel	0.3 ms for rated resistance and rated inductance 3.0 ms for rated capacitance
Current load on voltage output, max	10 mA
Resistive load on current output	0...300 Ω (includes wire resistance)
Load range on voltage output	> 1 kΩ
Inductive load, max	Current: 0.1 mH Voltage: 1 µF
Accuracy[2]	Current: ±0.5% full scale @ 25 °C (77 °F) Voltage: ±0.5% full scale @ 25 °C (77 °F)
Overall accuracy	Current: ±1.0% full scale @ 0...60 °C (32...140 °F) Voltage: ±0.6% full scale @ 0...60 °C (32...140 °F)
Accuracy drift with temperature	Current: ±0.01% per °C Voltage: ±0.01% per °C
Output ripple[3]	±0.05% @ 0...50 kHz
Nonlinearity	±0.4%
Repeatability[4]	±0.05%
Output impedance	10 kΩ
Open and short-circuit protection	Yes
Short-circuit, max	40 mA
Open circuit, max	15V
Output response at system powerup and power down	+2.0...-1.0V DC spike for < 6 ms
Isolation voltage	500V AC or 710V DC for 1 min (qualification test), output group to bus 30V AC/30V DC working voltage (IEC Class II reinforced insulation)

(1) The over- or under-range flag comes on when the normal operating range (over/under) is exceeded. The module continues to convert the analog input up to the maximum full scale range. The flag automatically resets when within the normal operating range.
(2) Includes offset, gain, nonlinearity, and repeatability error terms.
(3) Output ripple is the amount that a fixed output varies with time, which assumes a constant load and temperature.
(4) Repeatability is the ability of the input module to register the same reading in successive measurements for the same input signal.

Response Speed - 1769-IF4XOF2

Fixed Filter Frequency	Filter Cutoff Frequency	Step Response % Complete	Step Response Time
2.7 kHz	2.7 kHz	63%	59 µs
2.7 kHz	2.7 kHz	90%	136 µs (nom)

Certifications - 1769-IF4XOF2

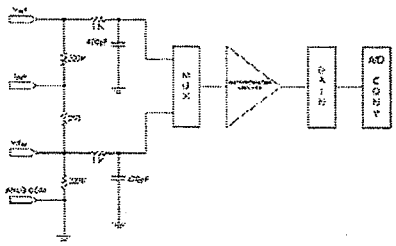
Certification[1]	1769-IF4XOF2
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

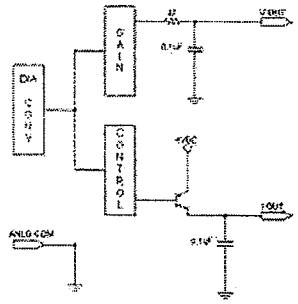
1769-IF4FXOF2F

Compact combination fast input/output analog module

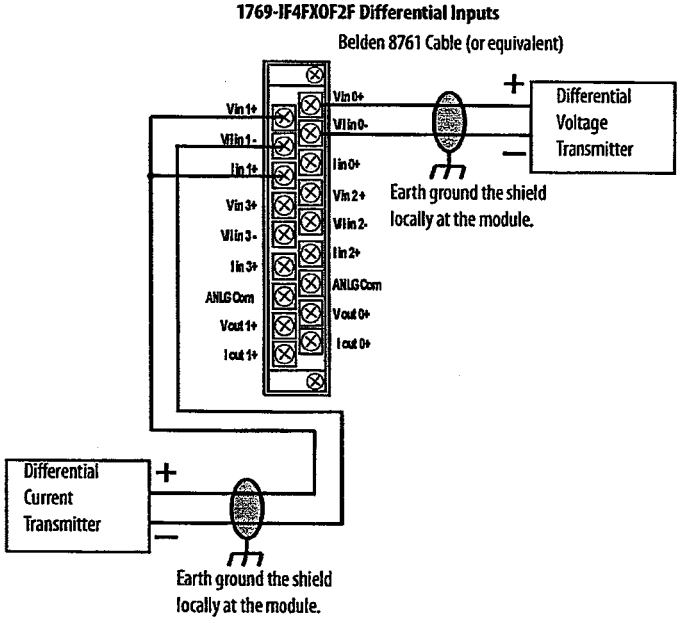
Simplified Input Circuit Diagram



Simplified Output Circuit Diagram

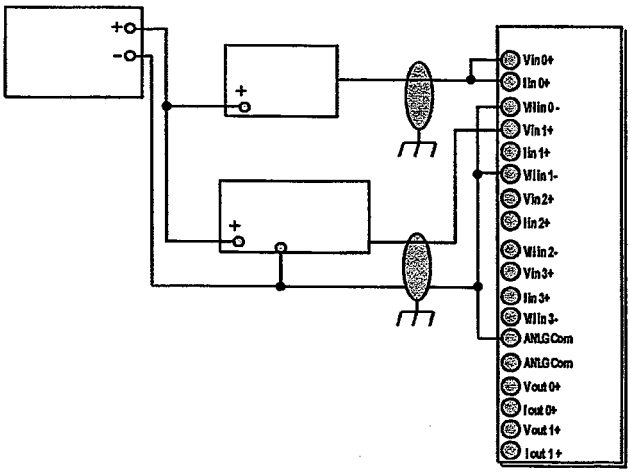


1769-IF4FXOF2F Differential Inputs



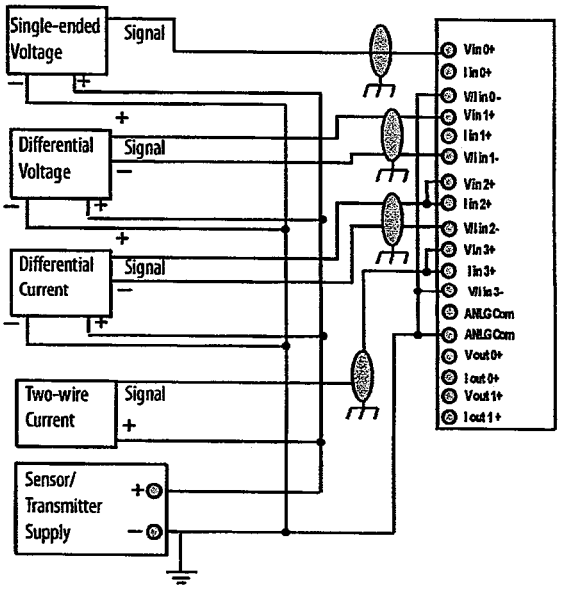
The sensor power supply must be rated Class 2.

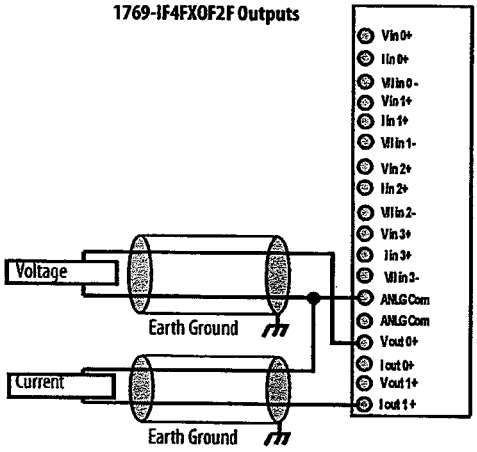
1769-IF4FXOF2F Single-ended Sensor/Transmitter Inputs



The sensor power supply must be rated Class 2.

1769-IF4FXOF2F Mixed Transmitter Inputs





Technical Specifications - 1769-IF4FXOF2F

Attribute	1769-IF4FXOF2F
Current draw @ 5.1V	220 mA
Current draw @ 24V	120 mA
Heat dissipation, max	3.39 W
Weight, approx	290 g (0.64 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA,2 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22…14 AWG) solid (22…16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
Replacement terminal block	1769-RTBN18 (1 per kit)
Replacement door label	1769-RL2 series B (2 per kit)
Replacement door	1769-RD (2 per kit)
Vendor ID code	1
Product type code	10
Product code	43
Input words	10
Output words	4
Configuration words	42
Enclosure type rating	None (open-style)

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

1769-IF4FXOF2F Input Specifications

Attribute	1769-IF4FXOF2F
Inputs	4 differential or single-ended
Input range	±10V 0…10V 0…5V 1…5V 0…20 mA 4…20 mA
Full scale range[1]	±10.5V -0.5…10.5V -0.5…5.25V 0.5…5.25V 0…21 mA 3.2…21 mA
Converter type	Successive approximation
Resolution [2]	14 bits (unipolar) 14 bits plus sign (bipolar)
Rated working voltage[3]	30V AC/30V DC
Common mode voltage range[4]	±10V DC max per channel
Common mode rejection	> 70 dB @ 50 and 60 Hz with the 10 Hz filter selected
Input impedance	Current: 250 Ω Voltage: 220 kΩ
Accuracy[5]	Current: ±0.2% full scale @ 25 °C (77 °F) Voltage: ±0.15% full scale @ 25 °C (77 °F)
Accuracy drift with temperature	Current: ±0.0045% per °C Voltage: ±0.003% per °C
Nonlinearity	±0.03%
Repeatability[6]	±0.03%
Module error	Current: ±0.3% Voltage: ±0.2%
Overload at input terminals, max[7]	Current: ±32 mA continuous, ±7.6V DC Voltage: ±30V DC continuous, 0.1 mA
Isolation voltage	500V AC or 710V DC for 1 minute (qualification test), group to bus 30V AC/30V DC working voltage (IEC Class II reinforced insulation)

(1) The over- or under-range flag comes on when the normal operating range (over/under) is exceeded. The module continues to convert the analog input up to the maximum full scale range. The flag automatically resets when within the normal operating range.
(2) Resolution is dependent upon your filter selection. The maximum resolution is achieved with either the 50 or 60 Hz filter selected.
(3) Rated working voltage is the maximum continuous voltage that can be applied at the input terminal, including the input signal and the value that floats above ground potential. For example, a 10V DC input signal and 20V DC potential above ground at the input terminal.
(4) For proper operation, both the plus and minus input terminals must be within ±10V DC of analog common.
(5) Includes offset, gain, nonlinearity, and repeatability error terms.
(6) Repeatability is the ability of the input module to register the same reading in successive measurements for the same input signal.
(7) Damage can occur to the input circuit if this value is exceeded.

1769-IF4FXOF2F Output Specifications

Attribute	1769-IF4FXOF2F
Outputs	2 single-ended
Output range	±10V 0…10V 0…5V 1…5V 0…20 mA 4…20 mA
Full scale range[1]	±10.5V -0.5…10.5V -0.5…5.25V 0.5…5.25V 0…21 mA 3.2…21 mA
Resolution	13 bits (unipolar) 13 bits plus sign (bipolar)
Conversion rate (all channels), max	1 ms
Step response to 63%[2]	2.0 ms
Current load on voltage output, max	10 mA
Resistive load	Current: 0…500 Ω (includes wire resistance) Voltage: 1 kΩ or greater
Inductive load, max	Current: 0.1 mH Voltage: 1 µF
Field calibration	None required
Accuracy[3]	±0.2% full scale @ 25 °C (77 °F)
Accuracy drift with temperature	Current: ±0.0058% per °C Voltage: ±0.0086% per °C
Output ripple[4]	±0.05% @ 0…50 kHz
Nonlinearity	±0.05%
Repeatability[5]	±0.05%
Module error	Current: ±0.4% Voltage: ±0.3%
Open and short-circuit protection	Yes
Short-circuit protection, max	50 mA
Output overvoltage protection	Yes
Rated working voltage[6]	30V AC/30V DC
Isolation voltage	500V AC or 710V DC for 1 min (qualification test), output group to bus 30V AC/30V DC working voltage (IEC Class II reinforced insulation)

(1) The over- or under-range flag comes on when the normal operating range (over/under) is exceeded. The module continues to convert the analog input up to the maximum full scale range. The flag automatically resets when within the normal operating range.
(2) Step response is the time between when the D/A converter was instructed to go from minimum to full range until the device is at 63% of full range.
(3) Includes offset, gain, nonlinearity, and repeatability error terms.
(4) Output ripple is the amount that a fixed output varies with time, which assumes a constant load and temperature.
(5) Repeatability is the ability of the input module to register the same reading in successive measurements for the same input signal.
(6) Rated working voltage is the maximum continuous voltage that can be applied at the input terminal, including the input signal and the value that floats above ground potential. For example, a 10V DC input signal and 20V DC potential above ground at the input terminal.

Response Speed - 1769-IF4FXOF2F

Filter Frequency	Channel Step Response
5 Hz	802 ms
10 Hz	401 ms
50 Hz	81 ms
60 Hz	65 ms
100 Hz	42 ms
250 Hz	17 ms
500 Hz	10 ms
1000 Hz	5 ms

Certifications - 1769-IF4FXOF2F

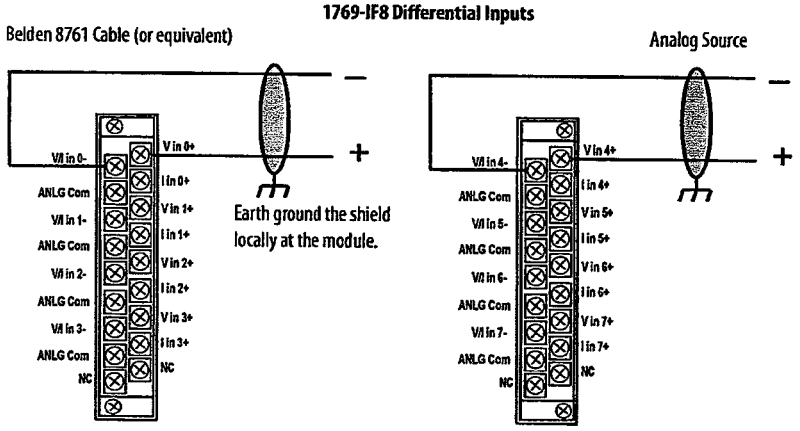
Certification[1]	1769-IF4FXOF2F
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

1769-IF8

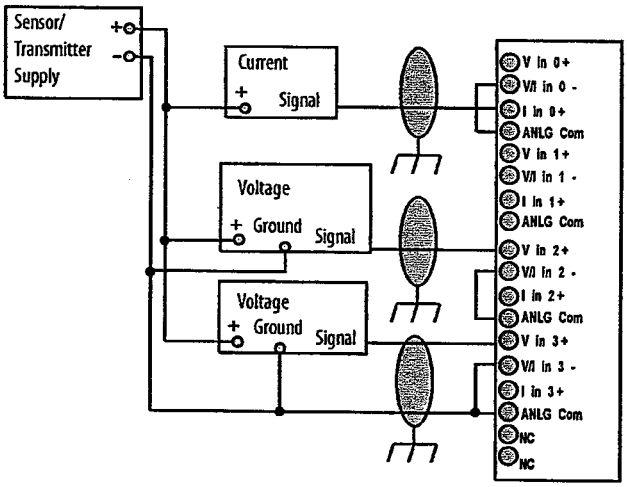
Compact voltage/current analog input module

1769-IF8 Differential Inputs



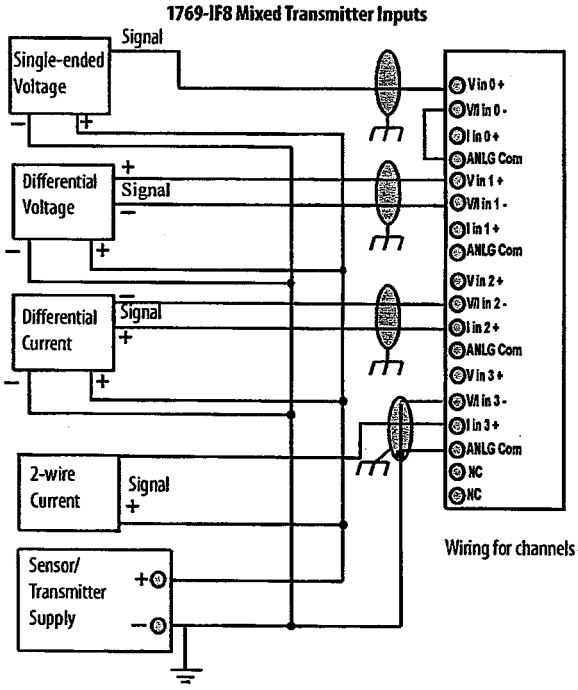
1769-IF8 Single-ended Sensor/Transmitter Inputs

The sensor power supply must be rated Class 2.



Wiring for channels 4...7 are identical.

1769-IF8 Mixed Transmitter Inputs



The sensor power supply must be rated Class 2.

Wiring for channels 4...7 are identical.

Technical Specifications - 1769-IF8

Attribute	1769-IF8
Inputs	8 differential or single-ended
Input range	±10V 0...10V 0...5V 1...5V 0...20 mA 4...20 mA
Full scale range[1]	±10.5V -0.5...10.5V -0.5...5.25V 0.5...5.25V 0...21 mA 3.2...21 mA
Current draw @ 5.1V	120 mA
Current draw @ 24V	70 mA
Converter type	Delta Sigma
Heat dissipation, max	3.24 W
Resolution [2]	16 bits (unipolar) 15 bits plus sign (bipolar)
Rated working voltage[3]	30V AC/30V DC
Common mode voltage range[4]	±10V DC max per channel
Common mode rejection	> 60 dB @ 50 and 60 Hz with the 10 Hz filter selected
Normal mode rejection ratio	-50 dB @ 50 and 60 Hz with the 10 Hz filter selected
Input impedance	Voltage: 220 kΩ Current: 250 Ω
Accuracy[5]	Voltage: ±0.2% full scale @ 25 °C (77 °F) Current: ±0.35% full scale @ 25 °C (77 °F)

Technical Specifications - 1769-IF8

Attribute	1769-IF8
Accuracy drift with temperature	Voltage: ±0.003% per °C Current: ±0.0045% per °C
Nonlinearity	±0.03%
Repeatability(6)	±0.03%
Module error	Voltage: ±0.3% Current: ±0.5%
Overload at input terminals, max(7)	Voltage: ±30V DC continuous, 0.1 mA Current: ±32 mA continuous, ±7.6V DC
Isolation voltage	500V AC or 710V DC for 1 minute (qualification test), group to bus 30V AC/30V DC working voltage (IEC Class II reinforced insulation)
Weight, approx	450 g (0.99 lb)
Dimensions (HxWxD), approx	118 x 52.5 x 87 mm (4.65 x 2.07 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1.5
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
Replacement terminal block	1769-RTBN18 (1 per kit)
Replacement door	Not available
Vendor ID code	1
Product type code	10
Product code	38
Enclosure type rating	None (open-style)

(1) The over- or under-range flag comes on when the normal operating range (over/under) is exceeded. The module continues to convert the analog input up to the maximum full scale range. The flag automatically resets when within the normal operating range.
(2) Resolution is dependent upon your filter selection. The maximum resolution is achieved with either the 50 or 60 Hz filter selected.
(3) Rated working voltage is the maximum continuous voltage that can be applied at the input terminal, including the input signal and the value that floats above ground potential. For example, a 10V DC input signal and 20V DC potential above ground at the input terminal.
(4) For proper operation, both the plus and minus input terminals must be within ±10V DC of analog common.
(5) Includes offset, gain, nonlinearity, and repeatability error terms.
(6) Repeatability is the ability of the input module to register the same reading in successive measurements for the same input signal.
(7) Damage can occur to the input circuit if this value is exceeded.

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

Response Speed - 1769-IF8

Filter Frequency	Update Time Per Channel	Update Time Per Module
10 Hz	100 ms	400 ms
50 Hz	30 ms	120 ms
60 Hz	30 ms	120 ms
250 Hz	9 ms	36 ms
500 Hz	6 ms	24 ms

Certifications - 1769-IF8

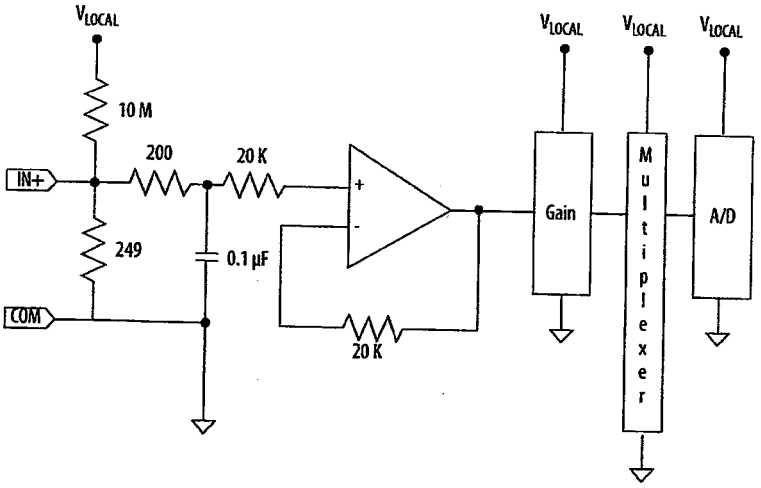
Certification[1]	1769-IF8
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

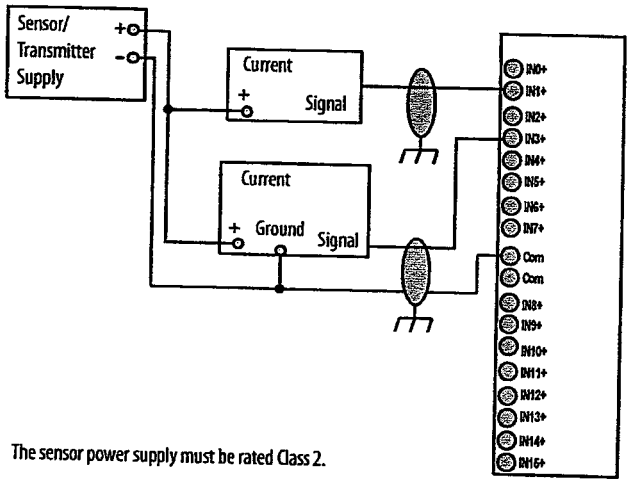
1769-IF16C

Compact current analog input module

Simplified Input Circuit Diagram



1769-IF16C Sensor/Transmitter Inputs



The sensor power supply must be rated Class 2.

Technical Specifications - 1769-IF16C

Attribute	1769-IF16C
Inputs	16 single-ended
Input range	0...20 mA 4...20 mA
Full scale range[1]	0...21 mA 3.2...21 mA
Current draw @ 5.1V	190 mA
Current draw @ 24V	70 mA
Heat dissipation, max	4.0 W
Converter type	Sigma Delta
Resolution [2]	16 bits (unipolar) 15 bits plus sign (bipolar)
Rated working voltage[3]	30V AC/30V DC

Technical Specifications - 1769-IF16C

Attribute	1769-IF16C
Common mode voltage range[4]	±10V DC max per channel
Common mode rejection	> 60 dB @ 50 and 60 Hz with the 16 Hz filter selected
Input impedance	249 Ω
Accuracy[5]	±0.5% full scale @ 25 °C (77 °F)
Accuracy drift with temperature	±0.0045% per °C
Nonlinearity	±0.03%
Repeatability[6]	±0.03%
Module error	1.25%
Overload at input terminals, max[7]	±28 mA continuous, ±7.6V DC
Isolation voltage	500V AC or 710V DC for 1 minute (qualification test), group to bus 30V AC/30V DC working voltage (IEC Class II reinforced insulation)
Weight, approx	281 g (0.62 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	.0.46 N•m (4.1 lb•in)
Wire size	(22…14 AWG) solid (22…16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
Replacement terminal block	1769-RTBN18 (1 per kit)
Replacement door label	1769-RL2 series B (2 per kit)
Replacement door	1769-RD (2 per kit)
Vendor ID code	1
Product type code	10
Product code	47
Input words	22
Output words	2
Configuration words	98
Enclosure type rating	None (open-style)

(1) The over- or under-range flag comes on when the normal operating range (over/under) is exceeded. The module continues to convert the analog input up to the maximum full scale range. The flag automatically resets when within the normal operating range.
(2) Resolution is dependent upon your filter selection. The maximum resolution is achieved with either the 50 or 60 Hz filter selected.
(3) Rated working voltage is the maximum continuous voltage that can be applied at the input terminal, including the input signal and the value that floats above ground potential. For example, a 10V DC input signal and 20V DC potential above ground at the input terminal.
(4) For proper operation, both the plus and minus input terminals must be within ±10V DC of analog common.
(5) Includes offset, gain, nonlinearity, and repeatability error terms.
(6) Repeatability is the ability of the input module to register the same reading in successive measurements for the same input signal.
(7) Damage can occur to the input circuit if this value is exceeded.

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

Response Speed - 1769-IF16C

Filter Frequency	Step Response	Update per Input Point	Update per Module
16 Hz	1550 ms	200 ms	1600 ms
50 Hz	500 ms	70 ms	560 ms
60 Hz	420 ms	60 ms	480 ms
315 Hz	90 ms	15 ms	120 ms
1365 Hz	35 ms	5 ms	40 ms

Certifications - 1769-IF16C

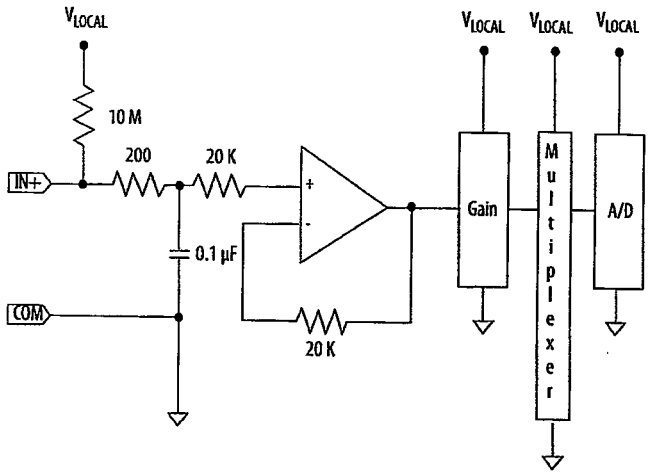
Certification[1]	1769-IF16C
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

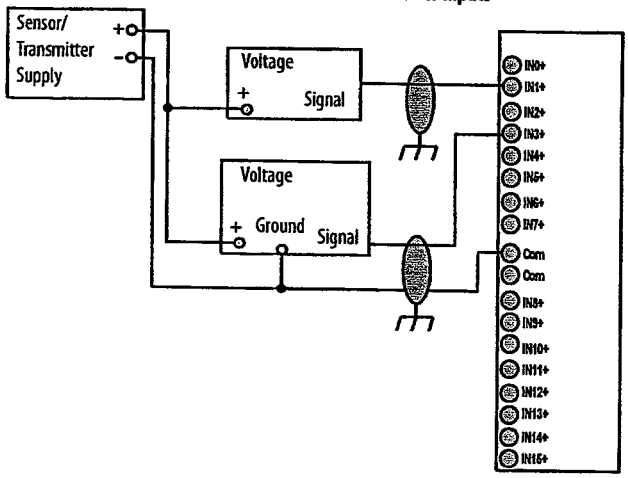
1769-IF16V

Compact voltage analog input module

Simplified Input Circuit Diagram



1769-IF16V Sensor/Transmitter Inputs



The sensor power supply must be rated Class 2.

Technical Specifications - 1769-IF16V

Attribute	1769-IF16V
Inputs	16 single-ended
Input range	±10V 0...10V 0...5V 1...5V
Full scale range[1]	±10.5V -0.5...10.5V -0.5...5.25V 0.5...5.25V
Current draw @ 5.1V	190 mA
Current draw @ 24V	70 mA
Heat dissipation, max	2.4W
Converter type	Sigma Delta
Resolution[2]	16 bits (unipolar) 15 bits plus sign (bipolar)
Rated working voltage[3]	30V AC/30V DC
Common mode voltage range[4]	±10V DC max per channel
Common mode rejection	> 60 dB @ 50 and 60 Hz with the 16 Hz filter selected
Input impedance	> 1 MΩ
Accuracy[5]	±0.35% full scale @ 25 °C (77 °F)
Accuracy drift with temperature	±0.03% per °C
Nonlinearity	±0.03%
Repeatability[6]	±0.06%
Module error	1.0%
Overload at input terminals, max[7]	±30 mA continuous, ±7.6V DC
Isolation voltage	500V AC or 710V DC for 1 minute (qualification test), group to bus 30V AC/30V DC working voltage (IEC Class II reinforced insulation)
Weight, approx	281 g (0.62 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
Replacement terminal block	1769-RTBN18 (1 per kit)
Replacement door label	1769-RL2 series B (2 per kit)
Replacement door	1769-RD (2 per kit)
Vendor ID code	1
Product type code	10
Product code	46
Input words	22

Technical Specifications - 1769-IF16V

Attribute	1769-IF16V
Output words	2
Configuration words	98
Enclosure type rating	None (open-style)

(1) The over- or under-range flag comes on when the normal operating range (over/under) is exceeded. The module continues to convert the analog input up to the maximum full scale range. The flag automatically resets when within the normal operating range.
(2) Resolution is dependent upon your filter selection. The maximum resolution is achieved with either the 50 or 60 Hz filter selected.
(3) Rated working voltage is the maximum continuous voltage that can be applied at the input terminal, including the input signal and the value that floats above ground potential. For example, a 10V DC input signal and 20V DC potential above ground at the input terminal.
(4) For proper operation, both the plus and minus input terminals must be within ±10V DC of analog common.
(5) Includes offset, gain, nonlinearity, and repeatability error terms.
(6) Repeatability is the ability of the input module to register the same reading in successive measurements for the same input signal.
(7) Damage can occur to the input circuit if this value is exceeded.

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

Response Speed - 1769-IF16V

Filter Frequency	Step Response	Update per Input Pair	Update per Module
16 Hz	1550 ms	200 ms	1600 ms
50 Hz	500 ms	70 ms	560 ms
60 Hz	420 ms	60 ms	480 ms
315 Hz	90 ms	15 ms	120 ms
1365 Hz	35 ms	5 ms	40 ms

Certifications - 1769-IF16V

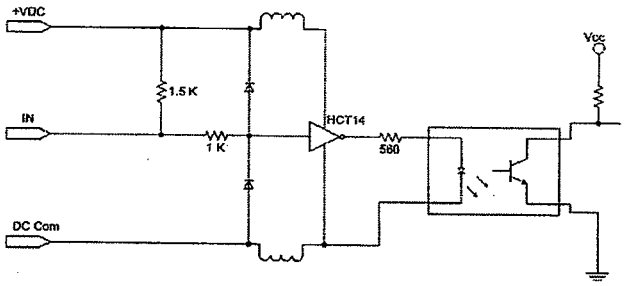
Certification(1)	1769-IF16V
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

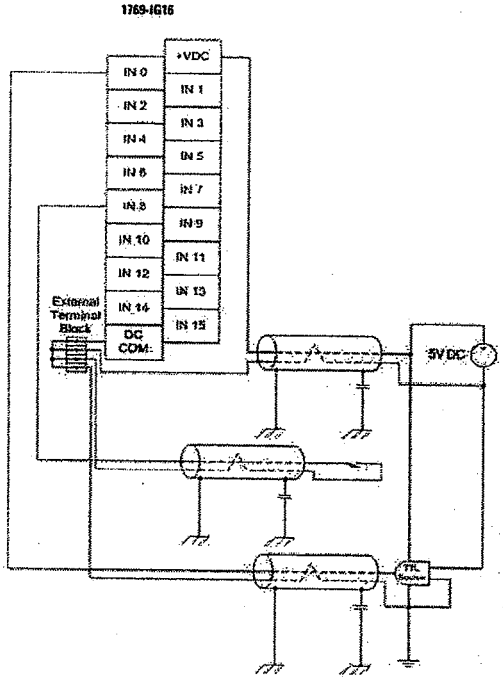
(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

1769-IG16

Compact TTL input module

Simplified Input Circuit Diagram





- Use Belden 8761, or equivalent, shielded wire.
- Do not connect more than two wires to any single terminal.
- Do not exceed 10 m (30 ft) for the DC power cable and I/O cables.
- The capacitors that are shown ind the diagram must be 0.01µF and rated for 2000V min.
- User power supply must be rated Class 2 with a 5V DC range of 4.5...5.5V DC.

Low to True Format - 1769-IG16

- -0.2...0.8V = Input on-state is guaranteed
- 0.8...2.0V = Input state is not guaranteed
- 2.0...5.5V = Input off-state is guaranteed

Technical Specifications - 1769-IG16

Attribute	1769-IG16
Inputs	16
Voltage category	5V DC TTL source (Low=True)(1)
Operating voltage range	4.5...5.5V DC 50 mV peak-to-peak ripple max
Input delay, on	20 ms
Digital filter, off to on	0 s, 100 µs, 500 µs, 1 ms, 2 ms, 4 ms, 8 ms
Digital filter, on to off	0 s, 100 µs, 500 µs, 1 ms, 2 ms, 4 ms, 8 ms
Current draw @ 5.1V	120 mA
Heat dissipation, max	1.6 W
Off-state voltage, typical	2.0...5.5V DC
Off-state current, max	4.1 mA
On-state voltage, typical	-0.2...0.8V DC
On-state current, nom	3.7 mA @ 5V DC

Technical Specifications - 1769-IG16

Attribute	1769-IG16
Isolation voltage	Verified by one of these dielectric tests: 1200V AC for 2 s or 1697V DC for 2 s, input point to bus 75V DC working voltage (IEC Class II reinforced insulation)
Weight, approx	250 g (0.55 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
IEC input compatibility	No
Vendor ID code	1
Product type code	7
Product code	77
Input words	1
Output words	0
Configuration words	4
Enclosure type rating	None (open-style)

(1) TTL inputs are inverted (-0.2...0.8 = low voltage = True = On.) Use a NOT instruction in your program to convert to traditional True = High logic.

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

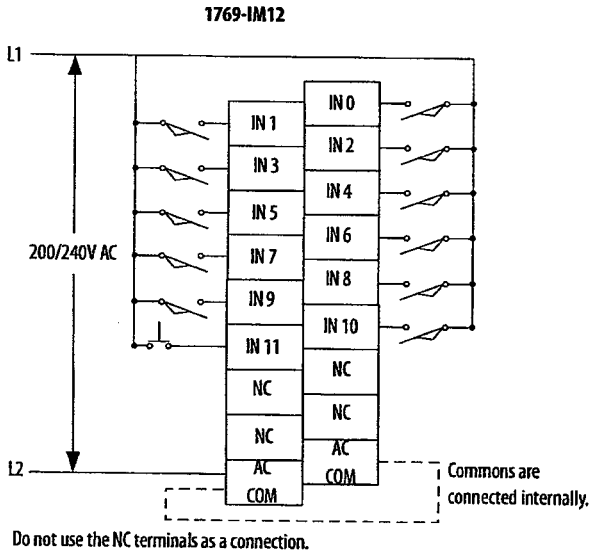
Certifications - 1769-IG16

Certification(1)	1769-IG16
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

1769-IM12

Compact 240V AC input module



Do not use the NC terminals as a connection.

Technical Specifications - 1769-IM12

Attribute	1769-IM12
Inputs	12 (12 points/group, internally connected commons)
Voltage category	200/240V AC
Operating voltage range	159...265V AC, 47...63 Hz
Input delay, on	20 ms
Input delay, off	20 ms
Current draw @ 5.1V	100 mA
Heat dissipation, max	3.65 W
Off-state voltage, max	40V AC
Off-state current, max	2.5 mA
On-state voltage, min	159V AC
On-state current, min	5 mA @ 74V AC
On-state current, max	12 mA @ 120V AC
Inrush current, max(1)	250 mA
Input impedance, max	27 kΩ @ 50 Hz 23 kΩ @ 60 Hz
Isolation voltage	Verified by one of these dielectric tests: 1836V AC for 1 s or 2596V DC for 1 s, input point to bus 132V AC working voltage (IEC Class II reinforced insulation)
Weight, approx	300 g (0.61 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4

Technical Specifications - 1769-IM12

Attribute	1769-IM12
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
IEC input compatibility	Type 1+
Replacement terminal block	1769-RTBN18 (1 per kit)
Replacement door label	1769-RL1 (2 per kit)
Replacement door	1769-RD (2 per kit)
Vendor ID code	1
Product type code	7
Product code	83
Enclosure type rating	None (open-style)

(1) A current limiting resistor can be used to limit inrush current; however, the operating characteristics of the AC input circuit are affected. If a 6.8 kΩ (2.5 W minimum) resistor is placed in series with the input, the inrush current is reduced to 35 mA. In this configuration, the minimum on-state voltage increases to 92V AC. Before adding the resistor in a hazardous environment, be sure to consider the operating temperature of the resistor and the temperature limits of the environment. The operating temperature of the resistor must remain below the temperature limit of the environment.

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

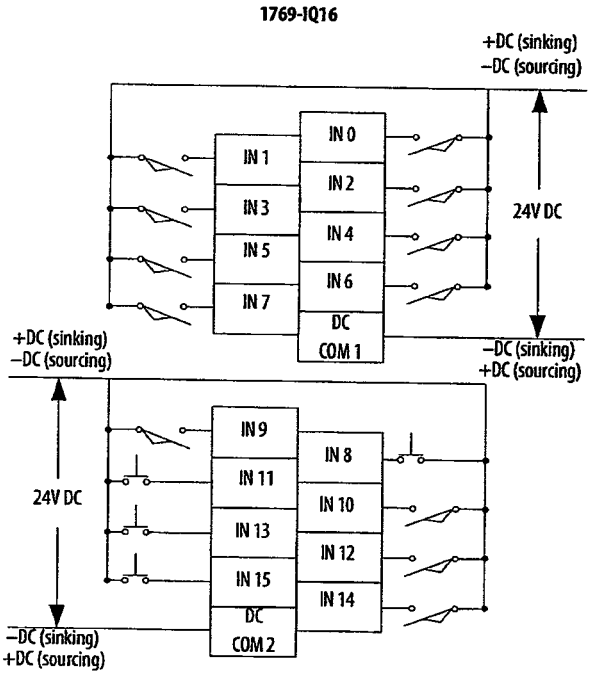
Certifications - 1769-IM12

Certification[1]	1769-IM12
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions European Union 2014/35/EU LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

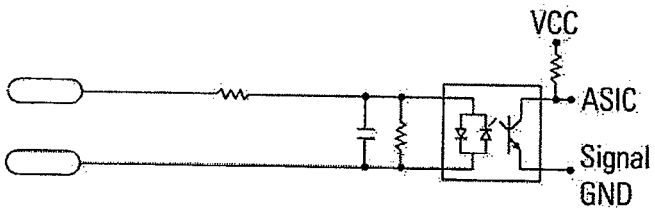
(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

1769-IQ16

Compact 24V DC sink/source input module



Simplified Input Circuit Diagram



Technical Specifications - 1769-IQ16

Attribute	1769-IQ16
Inputs	16 (8 points/group)
Voltage category	24V DC sink/source
Operating voltage range	10...30V DC @ 30 °C (86 °F) 10...26.4V DC @ 60 °C (140 °F)
Input delay, on	8 ms
Input delay, off	8 ms
Current draw @ 5.1V	115 mA
Heat dissipation, max	3.55 W
Off-state voltage, max	5V DC

Technical Specifications - 1769-IQ16

Attribute	1769-IQ16
Off-state current, max	1.5 mA
On-state voltage, min	10V DC
On-state current, min	2 mA
Inrush current, max	250 mA
Input impedance, nom	3 kΩ
Isolation voltage	Verified by one of these dielectric tests: 1200V AC for 1 s or 1697V DC for 1 s, input point to bus and group to group 75V DC working voltage (IEC Class II reinforced insulation)
Weight, approx	270 g (0.60 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
IEC input compatibility	Type 1+
Replacement terminal block	1769-RTBN18 (1 per kit)
Replacement door label	1769-RL1 (2 per kit)
Replacement door	1769-RD (2 per kit)
Vendor ID code	1
Product type code	7
Product code	67
Enclosure type rating	None (open-style)

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

Certifications - 1769-IQ16

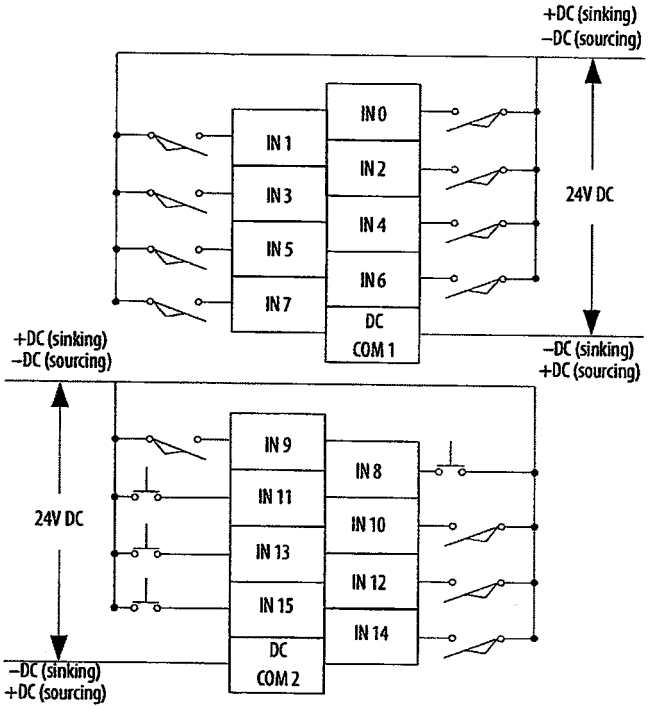
Certification[1]	1769-IQ16
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

1769-IQ16F

Compact 24V DC sink/source, high-speed input module

1769-IQ16



Technical Specifications - 1769-IQ16F

Attribute	1769-IQ16F
Inputs	16 (8 points/group)
Voltage category	24V DC sink/source
Operating voltage range	10...30V DC @ 30 °C (86 °F) 10...26.4V DC @ 60 °C (140 °F)
Digital filter, off to on	0 s, 100 µs, 500 µs, 1 ms, 2 ms
Digital filter, on to off	0 s, 100 µs, 500 µs, 1 ms, 2 ms
Input delay, off to on	100 µs, typical 300 µs, max
Input delay, on to off	250 µs, typical 1 ms, max
Current draw @ 5.1V	110 mA
Heat dissipation, max	3.55 W
Off-state voltage, max	5V DC
Off-state current, max	1.5 mA
On-state voltage, min	10V DC
On-state current, min	2 mA
Inrush current, max	250 mA
Input impedance, nom	3 kΩ

Technical Specifications - 1769-IQ16F

Attribute	1769-IQ16F
Isolation voltage	Verified by one of these dielectric tests: 1200V AC for 1 s or 1697V DC for 1 s, input point to bus and group to group 75V DC working voltage (IEC Class II reinforced insulation)
Weight, approx	270 g (0.60 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
IEC input compatibility	Type 1+
Replacement terminal block	1769-RTBN18 (1 per kit)
Replacement door label	1769-RL1 (2 per kit)
Replacement door	1769-RD (2 per kit)
Vendor ID code	1
Product type code	7
Product code	69
Enclosure type rating	None (open-style)

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

Certifications - 1769-IQ16F

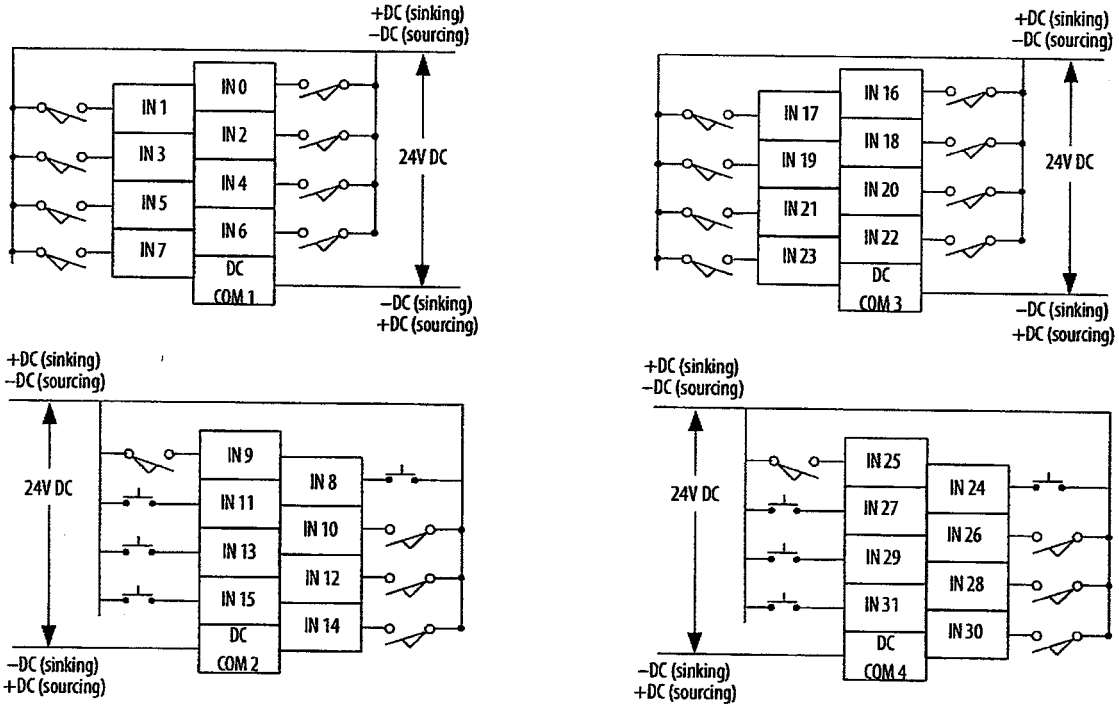
Certification[1]	1769-IQ16F
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

1769-IQ32

Compact 24V DC sink/source input module

1769-IQ32



Technical Specifications - 1769-IQ32

Attribute	1769-IQ32
Inputs	32 (8 points/group)
Voltage category	24V DC sink/source
Operating voltage range	10...30V DC @ 30 °C (86 °F) 10...26.4V DC @ 60 °C (140 °F)
Input delay, on	8 ms
Input delay, off	8 ms
Current draw @ 5.1V	170 mA
Heat dissipation, max	4.6 W
Off-state voltage, max	5V DC
Off-state current, max	1.5 mA
On-state voltage, min	10V DC
On-state current, min	2 mA
Inrush current, max	250 mA
Input impedance, nominal	5.2 kΩ @ 24V DC 6.1 kΩ @ 30V DC
Isolation voltage	Verified by one of these dielectric tests: 1200V AC for 1 s or 1697V DC for 1 s, input point to bus and group to group 75V DC working voltage (IEC Class II reinforced insulation)
Weight, approx	440 g (0.97 lb)

Technical Specifications - 1769-IQ32

Attribute	1769-IQ32
Dimensions (HxWxD), approx	118 x 52.5 x 87 mm (4.65 x 2.07 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1.5
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
IEC input compatibility	Type 1+
Replacement terminal block	1769-RTBN18 (1 per kit)
Replacement door	Not available
Vendor ID code	1
Product type code	7
Product code	68
Enclosure type rating	None (open-style)

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

Certifications - 1769-IQ32

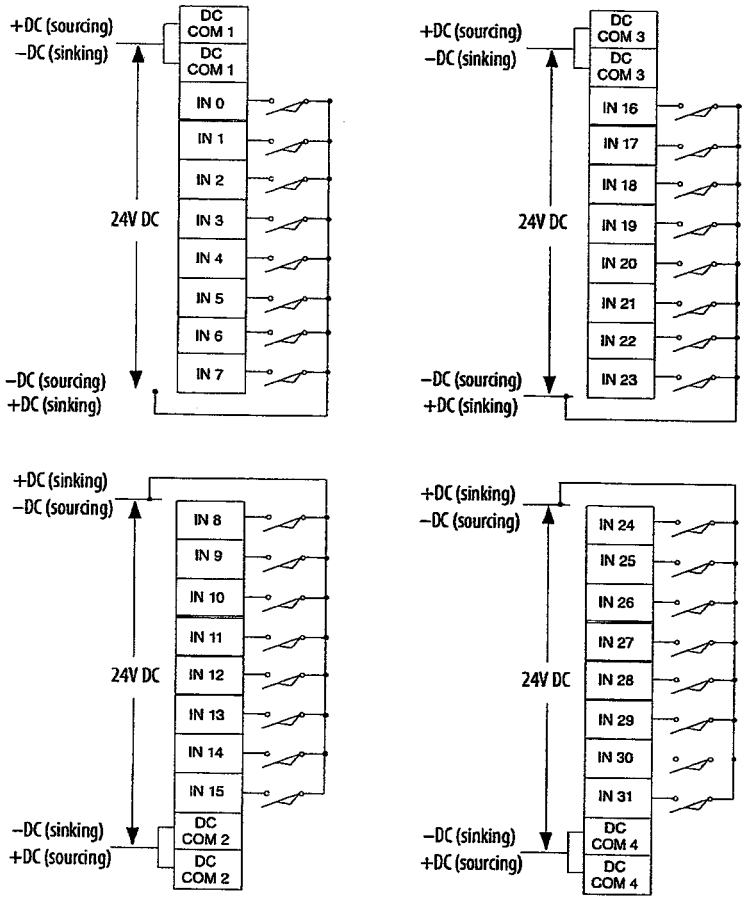
Certification[1]	1769-IQ32
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

1769-IQ32T

Compact 24V DC sink/source, terminated input module

1769-IQ32T



Technical Specifications - 1769-IQ32T

Attribute	1769-IQ32T
Inputs	32 terminated (8 points/group)
Voltage category	24V DC sink/source
Operating voltage range	20.4...26.4V DC @ 60 °C (140 °F)
Digital filter, off to on	0 s, 100 µs, 500 µs, 1 ms, 2 ms, 4 ms, 8 ms
Digital filter, on to off	0 s, 100 µs, 500 µs, 1 ms, 2 ms, 4 ms, 8 ms
Input delay, off to on	0.1 ms, typical 0.42 ms, max
Input delay, on to off	0.25 ms, typical 1.0 ms, max
Current draw @ 5.1V	170 mA
Heat dissipation, max	4.77 W
Off-state voltage, max	11V DC
Off-state current, max	1.7 mA
On-state voltage, min	19V DC

Technical Specifications - 1769-IQ32T

Attribute	1769-IQ32T
On-state current, min	2 mA
Inrush current, max	5 mA
Input impedance, nom	5.6 kΩ
Isolation voltage	Verified by one of these dielectric tests: 1200V AC for 1 s or 1697V DC for 1 s, input point to bus and group to group 75V DC working voltage (IEC Class II reinforced insulation)
Weight, approx	280 g (0.61 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
IEC input compatibility	Type 1+
Replacement connector	1746-N3 (1 connector, 40 terminals)
Vendor ID code	1
Product type code	7
Product code	76
Enclosure type rating	None (open-style)

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

Certifications - 1769-IQ32T

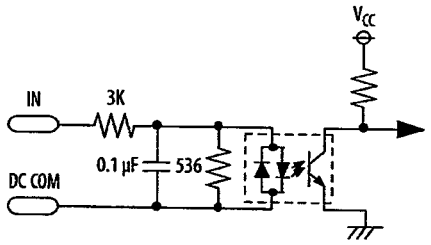
Certification[1]	1769-IQ32T
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

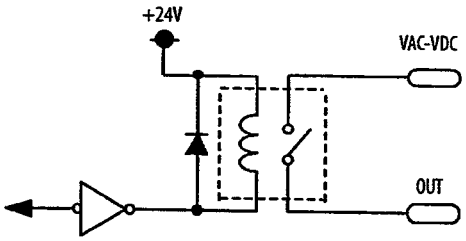
1769-IQ6XOW4

Compact combination 24V DC sink/source input and AC/DC relay output module

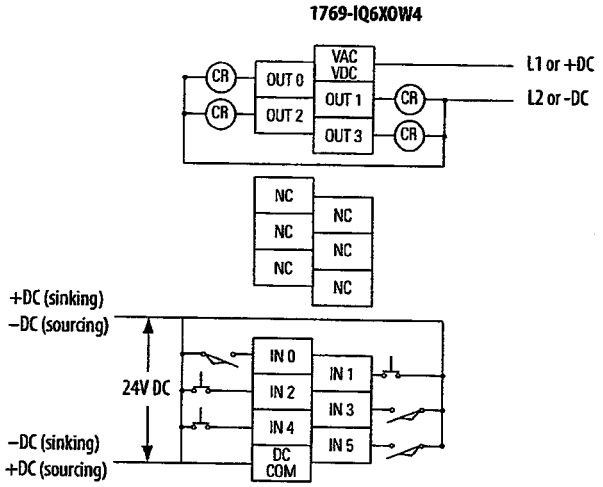
Simplified Input Circuit Diagram



Simplified Output Circuit Diagram



1769-IQ6XOW4



Technical Specifications - 1769-IQ6XOW4

Attribute	1769-IQ6XOW4
Current draw @ 5.1V	105 mA
Current draw @ 24V	50 mA
Heat dissipation, max	2.75 W
Off-state voltage, max	11V DC
Isolation voltage	Verified by one of these dielectric tests: 1200V AC for 1 s or 1697V DC for 1 s, input group to bus, output group to bus, and input group to output group 75V DC working voltage (IEC Class II reinforced insulation)
Weight, approx	280 g (0.61 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22…14 AWG) solid (22…16 AWG) stranded

Technical Specifications - 1769-IQ6XOW4

Attribute	1769-IQ6XOW4
Wire type	Cu-90 °C (194 °F)
IEC input compatibility	Type 1+
Replacement terminal block	1769-RTBN18 (1 per kit)
Replacement door label	1769-RL1 (2 per kit)
Replacement door	1769-RD (2 per kit)
Vendor ID code	1
Product type code	7
Product code	66
Enclosure type rating	None (open-style)

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

1769-IQ6XOW4 Input Specifications

Attribute	1769-IQ6XOW4
Inputs	6
Voltage category	24V DC sink/source
Operating voltage range	10...30V DC @ 30 °C (86 °F) 10...26.4V DC @ 60 °C (140 °F)
Delay, on	8 ms
Delay, off	8 ms
Off-state voltage, max	5V DC
Off-state current, max	1.5 mA
On-state voltage, min	10V DC
On-state current, min	2.0 mA
Inrush current, max	250 mA
Input impedance, nom	3 kΩ
IEC input compatibility	Type 3

1769-IQ6XOW4 Output Specifications

Attribute	1769-IQ6XOW4
Outputs	4
Voltage category	AC/DC normally open relay contacts
Operating voltage range	5...265V AC 5...125V DC
Delay, on	10 ms
Delay, off	10 ms
Off-state leakage, max	0 mA
On-state current, min	10 mA @ 5V DC
Current per point, max	2.5 A
Current per module, max	8 A

Relay Contact Ratings - 1769-IQ6XOW4

Volts, max	Continuous Amps per Point, max	Amperes[1]		Voltamperes		NEMA ICS 2-125
		Make	Break	Make	Break	
240V AC	2.5 A	7.5 A	0.75 A	1800VA	180VA	C300
120V AC		15 A	1.5 A			
125V DC	1.0 A	0.22 A[2]		28VA		R150
24V DC	2.0 A	1.2 A[2]		28VA		—

(1) If you connect surge suppressors across your external inductive load, you extend the life of the relay contacts.

(2) For DC voltage applications, the make/break ampere rating for relay contacts can be determined by dividing 28VA by the applied DC voltage. For example, 28 VA/48V DC = 0.58 A. For DC voltage applications less than 48V, the make/break ratings for relay contacts cannot exceed 2 A.

Certifications - 1769-IQ6XOW4

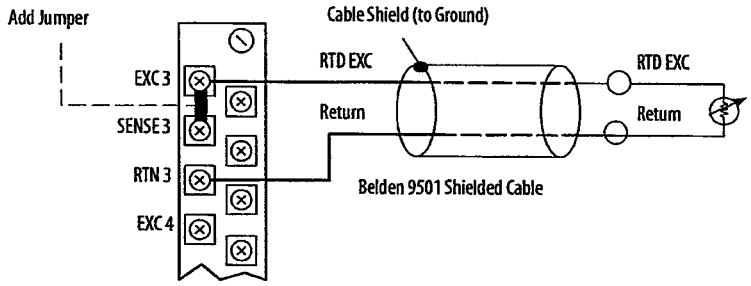
Certification[1]	1769-IQ6XOW4
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions European Union 2014/35/EU LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

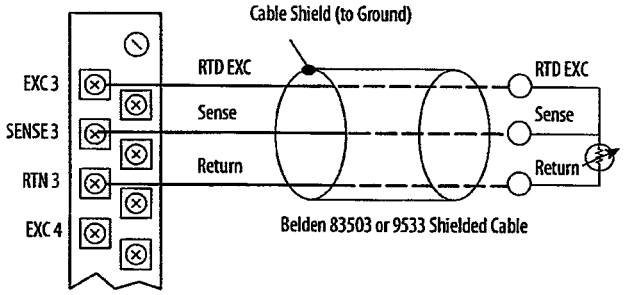
1769-IR6

Compact RTD/resistance input module

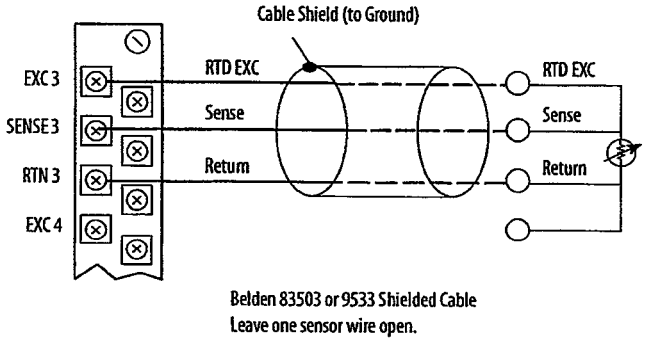
Two Wire RTD Configuration



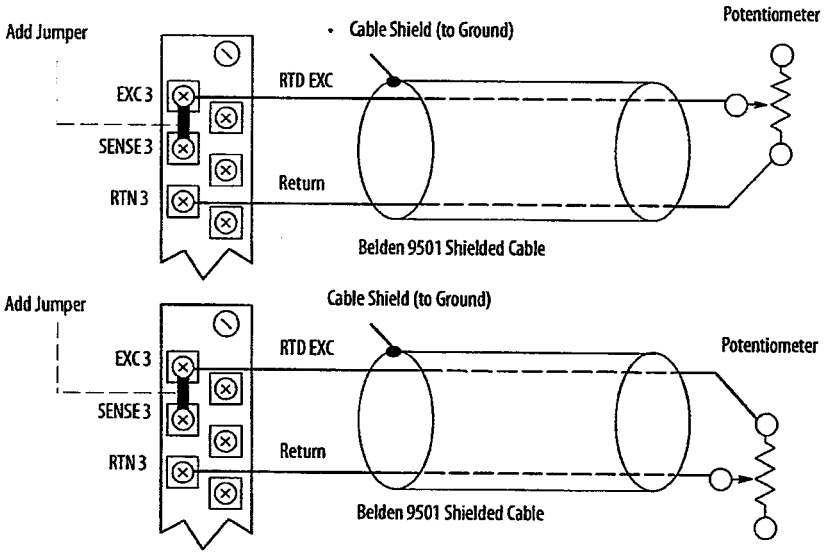
Three Wire RTD Configuration



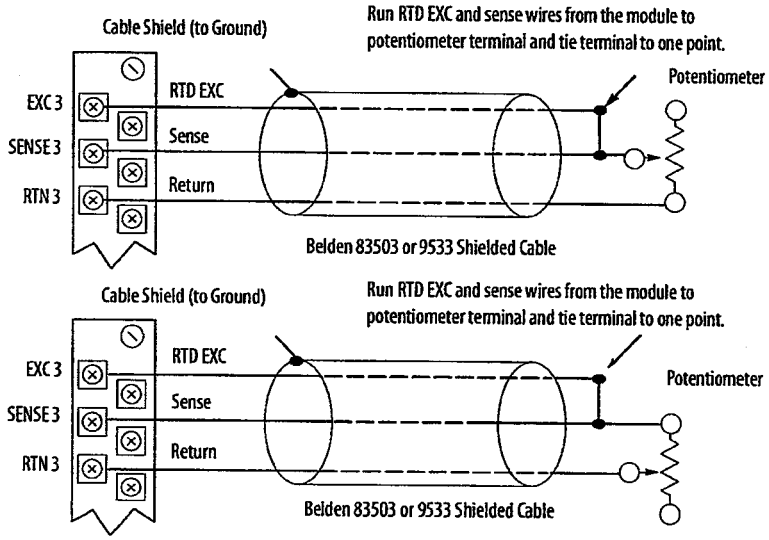
Four Wire RTD Configuration



Two Wire Potentiometer Configuration



Three Wire Potentiometer Configuration



Data Formats for RTD Temperature Ranges for 0.5 mA and 1.0 mA Excitation Current

RTD Input Type	Engineering Units x1		Engineering Units x10		Scaled-for-PID	Proportional Counts
	0.1 °C	0.1 °F	1.0 °C	1.0 °F		
100 Ω Platinum 385	-2000...+8500	-3280...+15620	-200...+850	-328...+1562	0...16383	-32768...+32767
200 Ω Platinum 385	-2000...+8500	-3280...+15620	-200...+850	-328...+1562	0...16383	-32768...+32767
500 Ω Platinum 385	-2000...+8500	-3280...+15620	-200...+850	-328...+1562	0...16383	-32768...+32767
1000 Ω Platinum 385	-2000...+8500	-3280...+15620	-200...+850	-328...+1562	0...16383	-32768...+32767
100 Ω Platinum 3916	-2000...+6300	-3280...+11660	-200...+630	-328...+1166	0...16383	-32768...+32767
200 Ω Platinum 3916	-2000...+6300	-3280...+11660	-200...+630	328...+1166	0...16383	-32768...+32767
500 Ω Platinum 3916	-2000...+6300	-3280...+11660	-200...+630	328...+1166	0...16383	-32768...+32767
1000 Ω Platinum 3916	-2000...+6300	-3280...+11660	-200...+630	328...+1166	0...16383	-32768...+32767
10 Ω Copper 426	-1000...+2600	-1480...+5000	+100...+260	-148...+500	0...16383	-32768...+32767
120 Ω Nickel 618	-1000...+2600	-1480...+5000	-100...+260	-148...+500	0...16383	-32768...+32767
120 Ω Nickel 672	-800...+2600	-1120...+5000	-80...+260	-112...+500	0...16383	-32768...+32767
604 Ω Nickel Iron 518	-1000...+2600	-3280...+1560	-100...+200	-328...+156	0...16383	-32768...+32767

Temperature Range - 1769-IR6

RTD Type[1]		Temperature Range Using 0.5 mA Excitation	Temperature Range Using 1.0 mA Excitation
Platinum 385	100 Ω	-200...850 °C (-328...1562 °F)	-200...850 °C (-328...1562 °F)
	200 Ω	-200...850 °C (-328...1562 °F)	-200...850 °C (-328...1562 °F)
	500 Ω	-200...850 °C (-328...1562 °F)	-200...850 °C (-328...1562 °F)
	1000 Ω	-200...850 °C (-328...1562 °F)	N/A
Platinum 3916	100 Ω	-200C...630 °C (-328...1166 °F)	-200...630 °C (-328...1166 °F)
	200 Ω	-200C...630 °C (-328...1166 °F)	-200...630 °C (-328...1166 °F)
	500 Ω	-200C...630 °C (-328...1166 °F)	-200...630 °C (-328...1166 °F)
	1000 Ω	-200C...630 °C (-328...1166 °F)	N/A
Copper 426	10 Ω	N/A	-100...260 °C (-148...500 °F)
Nickel 618[2]	120 Ω	-100...260 °C (-148...500 °F)	-100...260 °C (-148...500 °F)
Nickel 672	120 Ω	-80...260 °C (-112...500 °F)	-80...260 °C (-112...500 °F)
Nickel-Iron 518	604 Ω	-200...180 °C (-328...338 °F)	-100...+200 °C (-148...392 °F)

(1) Digits following the RTD type represent the temperature coefficient of resistance (α), which is defined as the resistance change per Ω per °C. For instance, Platinum 385 refers to a Platinum RTD with $\alpha = 0.00385\ \Omega/\Omega\text{-}°C$, or simply 0.00385/°C.

(2) Actual value at 0 °C is 100 Ω per DIN standard.

Resistance Device Compatibility - 1769-IR6

Resistance Device Type	Resistance Range (0.5 mA Excitation)	Resistance Range (1.0 mA Excitation)
150 Ω	0...150 Ω	0...150 Ω
500 Ω	0...500 Ω	0...500 Ω
1000 Ω	0...1000 Ω	0...1000 Ω
3000 Ω	0...3000 Ω	N/A

Technical Specifications - 1769-IR6

Attribute	1769-IR6
Inputs	6 RTD inputs
Input range	0...150 Ω 0...500 Ω 0...1000 Ω 0...3000 Ω
Resolution	Input filter and configuration dependent
Sensors supported	100, 200, 500, 1000 Ω Platinum 385 100, 200, 500, 1000 Ω Platinum 3916 120 Ω Nickel 672 120 Ω Nickel 618 10 Ω Nickel-iron 518
Current draw @ 5.1V	100 mA
Current draw @ 24V	35 mA
Heat dissipation, max	1.5 W
Converter type	Sigma Delta
Common mode voltage range	±10V DC max
Common mode rejection	110 dB @ 50 Hz with the 10 or 50 Hz filter selected 110 dB @ 60 Hz with the 10 or 60 Hz filter selected
Normal mode rejection ratio	70 dB @ 50 Hz with the 10 or 50 Hz filter selected 70 dB @ 60 Hz with the 10 or 60 Hz filter selected
Cable impedance, max	25 Ω
Input impedance	> 10 MΩ
Accuracy @ 25 °C (77 °F) (1) (50/60 Hz filter)	±0.5 °C (0.9 °F) for Pt 385 ±0.4 °C (0.72 °F) for Pt 3916 ±0.3 °C (0.54 °F) for Ni ±0.3 °C (0.54 °F) for NiFe ±0.8 °C (1.44 °F) for Cu ±0.15 Ω for 150 Ω range ±0.5 Ω for 500 Ω range ±1.0 Ω for 1000 Ω range ±1.5 Ω for 3000 Ω range
Accuracy @ 0...60 °C (32...140 °F) (1) (50/60 Hz filter)	±0.9 °C (1.62 °F) for Pt 385 ±0.8 °C (1.44 °F) for Pt 3916 ±0.5 °C (0.9 °F) for Ni ±0.5 °C (0.9 °F) for NiFe ±1.1 °C (1.98 °F) for Cu ±0.25 Ω for 150 Ω range ±0.8 Ω for 500 Ω range ±1.5 Ω for 1000 Ω range ±2.5 Ω for 3000 Ω range
Accuracy drift @ 0...60 °C (32...140 °F) (1)	±0.026 °C/°C (0.026 °F/°F) for Pt 385 ±0.023 °C/°C (0.023 °F/°F) for Pt 3916 ±0.012 °C/°C (0.012 °F/°F) for Ni\ ±0.015 °C/°C (0.015 °F/°F) for NiFe ±0.032 °C/°C (0.032 °F/°F) for Cu ±0.007 Ω/°C (±0.013Ω/°F) for 150 Ω ±0.023 Ω/°C (±0.041Ω/°F) for 500 Ω ±0.043 Ω/°C (±0.077Ω/°F) for 1000 Ω ±0.072 Ω/°C (±0.130Ω/°F) for 3000 Ω
Nonlinearity	±0.05%
Repeatability(2) (50/60 Hz filter)	±0.01 °C (0.018 °F) for Ni and NiFe ±0.2 °C (0.36 °F) for other RTD inputs ±0.04 Ω for 150 Ω resistances ±0.2 Ω for other resistances
Open circuit detection time(3)	6 ms...303 s
Isolation voltage	720V DC for 1 minute, optical and magnetic (qualification), channel to bus 30V AC/30V DC working voltage (IEC Class II reinforced insulation)
Weight, approx	276 g (0.61 lb)

Technical Specifications - 1769-IR6

Attribute	1769-IR6
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Recommended cable	2-wire configuration: Belden 9501 or equivalent 3-wire configuration: Belden 9533 or equivalent 4-wire configuration: Belden 83503 or equivalent
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
IEC input compatibility	Type 1+
Replacement terminal block	1769-RTBN18 (1 per kit)
Replacement door label	1769-RL2 series B (2 per kit)
Replacement door	1769-RD (2 per kit)
Vendor ID code	1
Product type code	10
Product code	37
Enclosure type rating	None (open-style)

(1) Accuracy is dependent upon the Analog/Digital converter output rate selection, excitation current selection, data format, and input noise.
(2) Repeatability is the ability of the input module to register the same reading in successive measurements for the same input signal.
(3) Open-circuit detection time is equal to channel update time.

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

RTD Accuracy and Temperature Drift - 1769-IR6

RTD Type		Scaled Accuracy Max 25 °C (77 °F) with Calibration	Scaled Accuracy Max 0...60 °C (32...140 °F) with Calibration)	Temperature Drift Max from 25 °C (77 °F) without Calibration
Copper 426	10 Ω	±0.6 °C (1.08 °F)	±1.1 °C (1.98 °F)	±0.032 °C/°C (0.032 °F/°F)
Nickel 618	120 Ω	±0.2 °C (±0.36 °F)	±0.4 °C (±0.72 °F)	±0.012 °C/°C (±0.012 °F/°F)
Nickel 672	120 Ω	±0.2 °C (±0.36 °F)	±0.4 °C (±0.72 °F)	±0.012 °C/°C (±0.012 °F/°F)
Nickel-Iron 518	604 Ω	±0.3 °C (±0.54 °F)	±0.5 °C (±0.9 °F)	±0.015 °C/°C (±0.015 °F/°F)
Platinum 385	100 Ω	±0.5 °C (±0.9 °F)	±0.9 °C (±1.62 °F)	±0.026 °C/°C (±0.026 °F/°F)
	200 Ω	±0.5 °C (±0.9 °F)	±0.9 °C (±1.62 °F)	±0.026 °C/°C (±0.026 °F/°F)
	500 Ω	±0.5 °C (±0.9 °F)	±0.9 °C (±1.62 °F)	±0.026 °C/°C (±0.026 °F/°F)
	1000 Ω	±0.5 °C (±0.9 °F)	±0.9 °C (±1.62 °F)	±0.026 °C/°C (±0.026 °F/°F)
Platinum 3916	100 Ω	±0.4 °C (±0.7 2°F)	±0.8 °C (±1.44 °F)	±0.023 °C/°C (±0.023 °F/°F)
	200 Ω	±0.4 °C (±0.72 °F)	±0.8 °C (±1.44 °F)	±0.023 °C/°C (±0.023 °F/°F)
	500 Ω	±0.4 °C (±0.72 °F)	±0.8 °C (±1.44 °F)	±0.023 °C/°C (±0.023 °F/°F)
	1000 Ω	±0.4 °C (±0.72 °F)	±0.8 °C (±1.44 °F)	±0.023 °C/°C (±0.023 °F/°F)

RTD Standards - 1769-IR6

RTD Type	α[3]	IEC-751 1983, Amend. 2 1995	DIN 43760 1987	SAMA[4] Standard RC21-4-1966	Japanese Industrial Standard JIS C1604-1989	Japanese Industrial Standard JIS C1604-1997	Minco[5]
100 Ω Pt	0.00385	X	X			X	
200 Ω Pt	0.00385	X	X			X	
500 Ω Pt	0.00385	X	X			X	
1000 Ω Pt	0.00385	X	X			X	
100 Ω Pt	0.03916				X		
200 Ω Pt	0.03916				X		
500 Ω Pt	0.03916				X		
1000 Ω Pt	0.03916				X		
10 Ω Cu[1]	0.00426			X			
120 Ω Ni[2]	0.00618		X				
120 Ω Ni	0.00372						X
604 Ω NiFe	0.00518						X

(1) Actual value at 0 °C (32 °F) is 9.04 2 Ω per SAMA standard RC21-4-1966.
(2) Actual value at 0 °C (32 °F) is 100 Ω per SAMA standard RC21-4-1966.
(3) α is the temperature coefficient of resistance, which is defined as the resistance change per ohm per °C.
(4) Scientific Apparatus Makers Association
(5) Minco Type "NA" (Nickel) and Minco Type "FA" (Nickel-Iron)

Certifications - 1769-IR6

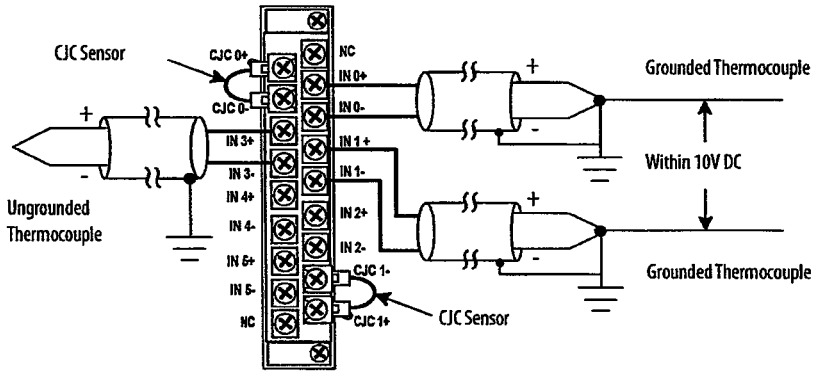
Certification[1]	1769-IR6
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

1769-IT6

Compact Thermocouple/mV input module

1769-IT6



Thermocouple Type	°C Temperature Range	°F Temperature Range
J	-210...+1200 °C	-346...+2192 °F
K	-270...+1370 °C	-454...+2498 °F
T	-270...+400 °C	-454...+752 °F
E	-270...+1000 °C	-454...+1832 °F
R	0...+1768 °C	+32...+3214 °F
S	0...+1768 °C	+32...+3214 °F
B	+300...+1820 °C	+572...+3308 °F
N	-210...+1300 °C	-346...+2372 °F
C	0...+2315 °C	+32...+4199 °F

Millivolt Input Type	Range
±50 mV	-50...+50 mV
±100 mV	-100...+100 mV

Input Type	Engineering Units x1		Engineering Units x10		Scaled-for-PID	Raw/ Proportional Data	Percent Range
	0.1 °C	0.1 °F	1.0 °C	1.0 °F			
J	-2100...+12000	-3460...+21920	-210...+1200	-346...+2192			
K	-2700... +13700	-4540...+24980	-270...+1370	-454...+2498			
T	-2700...+4000	-4540...+7520	-270...+400	-454...+752			
E	-2700...+10000	-4540...+18320	-270...+1000	-454...+1832			
R	0...+17680	+320...32140	0...+1768	+32...3214			
S	0...+17680	+320...32140	0...+1768	+32...3214	0...+16383	-32767...+32767	0...+10000
B	+3000...18200	+5720...32767(1)	+300...1820	+572...3308			
N	-2100...+13000	-3460... +23720	-210...+1300	-346...+2372			
C	0...+23150	+320...32767(1)	0...+2315	+32...4199			
±50 mV	-5000...+5000(2)		-500...+500(2)				
±100 mV	-10000...10000(2)		-1000...1000(2)				

(1) Type B and C thermocouples cannot be represented in engineering units x1 (°F) above 3276.7 °F; therefore, it is treated as an over-range error.

(2) When millivolts are selected, the temperature setting is ignored. Analog input date is the same for °C or °F selection.

IMPORTANT To reduce the effects of electrical noise, install the 1769-IT6 module at least two slots away from the AC power supplies.

Technical Specifications - 1769-IT6

Attribute	1769-IT6
Inputs	6 RTD inputs 2 CJC sensors
Input range	0...150 Ω 0...500 Ω 0...1000 Ω 0...3000 Ω
Resolution	Input filter and configuration dependent
Thermocouples	B, E, J, K, R, S, T, N, C
Bus current draw	5V DC, 140 mA 24V DC, 30 mA
Heat dissipation, max	1.5 W
Converter type	Sigma Delta
Response speed per channel	3...300 ms, depending on input filter and configuration
Rated working voltage[1]	30V AC/30V DC
Common mode voltage range[2]	±10V DC max
Common mode rejection	115 dB @ 50 Hz with 10 Hz or 50 Hz filter 115 dB @ 60 Hz with 10 Hz or 60 Hz filter
Normal mode rejection ratio	85 dB @ 50 Hz with the 10 or 50 Hz filter selected 85 dB @ 60 Hz with the 10 or 60 Hz filter selected
Cable impedance, max	25 Ω
Input impedance	> 10 MΩ
CJC assembly accuracy	±1.0 °C (±1.8 °F)
Nonlinearity (in percent full scale)	±0.03%
Open-circuit detection time	7 ms...2.1 s[3]
Overload at input terminals, max	±35V DC continuous[4]
Isolation voltage	720V DC for 1 min (qualification test) 30V AC/30V DC working voltage, group to bus
Weight, approx	276 g (0.61 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Recommended cable	2-wire configuration: Belden 9501 or equivalent 3-wire configuration: Belden 9533 or equivalent 4-wire configuration: Belden 83503 or equivalent
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
IEC input compatibility	Type 1+

Technical Specifications - 1769-IT6

Attribute	1769-IT6
Replacement terminal block	1769-RTBN18 (1 per kit)
Replacement door label	1769-RL2 series B (2 per kit)
Replacement door	1769-RD (2 per kit)
Vendor ID code	1
Product type code	10
Product code	36
Enclosure type rating	None (open-style)

(1) Rated working voltage is the maximum continuous voltage that can be applied at the input terminal, including the input signal and the value that floats above ground potential. For example, a 30V DC input signal and 20V DC potential above ground at the input terminal.
(2) For proper operation, both the plus and minus input terminals must be within ±10V DC of analog common.
(3) Open-circuit detection time is equal to the module scan time, which is based on the number of enabled channels, and the filter frequency of each channel.
(4) Maximum current input is limited due to input impedance.

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

Repeatability at 25 °C (77 °F) - 1769-IT6

Input Type	Repeatability for 10 Hz Filter[1] [2]
Thermocouple J	±0.1 °C [±0.18 °F]
Thermocouple N (-110…+1300 °C [-166…+2372 °F])	±0.1 °C [±0.18 °F]
Thermocouple N (-210…-110 °C [-346…-166 °F])	±0.25 °C [±0.45 °F]
Thermocouple T (-170…+400 °C [-274…+752 °F])	±0.1 °C [±0.18 °F]
Thermocouple T (-270…-170 °C [-454…-274 °F])	±1.5 °C [±2.7 °F]
Thermocouple K (-270…+1370 °C [-454…+2498 °F])	±0.1 °C [±0.18 °F]
Thermocouple (-270…-170 °C [-454…-274 °F])	±2.0 °C [±3.6 °F]
Thermocouple E (-220…+1000 °C [-364…+1832 °F])	±0.1 °C [±0.18 °F]
Thermocouple E (-270…-220 °C [-454…-364 °F])	±1.0 °C [±1.8 °F]
Thermocouples S and R	±0.4 °C [±0.72 °F]
Thermocouple C	±0.7 °C [±1.26 °F]
Thermocouple B	±0.2 °C [±0.36 °F]
±50 mV	±6 µV
±100 mV	±6 µV

(1) Repeatability is the ability of the input module to register the same reading in successive measurements for the same input signal.
(2) Repeatability at any other temperature in the 0…60 °C (32…140 °F) range is the same as long as the temperature is stable.

Accuracy - 1769-IT6

Input Type[1]	With Autocalibration Enabled		Without Autocalibration
	Accuracy[2] [3] for 10 Hz, 50 Hz, and 60 Hz Filters (max)		Temperature Drift (max)[2] [4]
	@ 25 °C (77 °F) Ambient	@ 0…60 °C (32…140 °F) Ambient	@ 0…60 °C (32…140 °F) Ambient
Thermocouple J (-210…1200 °C [-346…2192 °F])	±0.6 °C [± 1.1 °F]	±0.9 °C [± 1.7 °F]	±0.0218 °C/°C [±0.0218 °F/°F]
Thermocouple N (-200…+1300 °C [-328…2372 °F])	±1 °C [± 1.8 °F]	±1.5 °C [±2.7 °F]	±0.0367 °C/°C [±0.0367 °F/°F]
Thermocouple N (-210…-200 °C [-346…-328 °F])	±1.2 °C [±2.2 °F]	±1.8 °C [±3.3 °F]	±0.0424 °C/°C [±0.0424 °F/°F]
Thermocouple T (-230…+400 °C [-382…+752 °F])	±1°C [± 1.8 °F]	±1.5 °C [±2.7 °F]	±0.0349 °C/°C [±0.0349 °F/°F]
Thermocouple T (-270…-230 °C [-454…-382 °F])	±5.4 °C [± 9.8 °F]	±7.0° C [±12.6 °F]	±0.3500 °C/°C [±0.3500 °F/°F]

Accuracy - 1769-IT6

Input Type[1]	With Autocalibration Enabled		Without Autocalibration
	Accuracy[2] [3] for 10 Hz, 50 Hz, and 60 Hz Filters (max)		Temperature Drift (max)[2] [4]
	@ 25 °C (77 °F) Ambient	@ 0...60 °C (32...140 °F) Ambient	@ 0...60 °C (32...140 °F) Ambient
Thermocouple K (-230...+1370 °C [-382...+2498 °F])	±1 °C [± 1.8 °F]	±1.5 °C [±2.7 °F]	±0.4995 °C/°C [±0.4995 °F/°F]
Thermocouple K (-270...-225 °C [-454...-373 °F])	±7.5 °C [± 13.5 °F]	±10 °C [± 18 °F]	±0.0378 °C/°C [±0.0378 °F/°F]
Thermocouple E (-210...+1000 °C [-346...+1832 °F])	±0.5 °C [± 0.9 °F]	±0.8 °C [±1.5 °F]	±0.0199 °C/°C [±0.0199 °F/°F]
Thermocouple E (-270...-210 °C [-454...-346 °F])	±4.2 °C [± 7.6 °F]	±6.3 °C [±11.4 °F]	±0.2698 °C/°C [±0.2698 °F/°F]
Thermocouple R	±1.7 °C [± 3.1 °F]	±2.6 °C [± 4.7 °F]	±0.0613 °C/°C [±0.0613 °F/°F]
Thermocouple S	±1.7 °C [± 3.1 °F]	±2.6 °C [± 4.7 °F]	±0.0600 °C/°C [±0.0600 °F/°F]
Thermocouple C	±1.8 °C [±3.3 °F]	±3.5 °C [±6.3 °F]	±0.0899 °C/°C [±0.0899 °F/°F]
Thermocouple B	±3.0 °C [±5.4 °F]	±4.5 °C [±8.1 °F]	±0.1009 °C/°C [±0.1009 °F/°F]
±50 mV	±15 µV	±25 µV	±0.44 µV/°C [±0.80 µV/°F]
±100 mV	±20 µV	±30 µV	±0.69 µV/°C [±01.25 µV/°F]

(1) The module uses the National Institute of Standards and Technology (NIST) ITS-90 standard for thermocouple linearization.
(2) Accuracy and temperature drift information excludes the effects of errors or drift in the cold junction compensation circuit.
(3) Accuracy is dependent upon the analog/digital converter output rate selection, data format, and input noise.
(4) Temperature drift with autocalibration is slightly better than without autocalibration.

Certifications - 1769-IT6

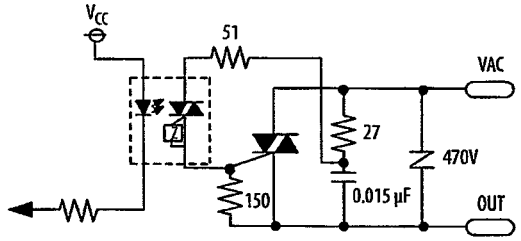
Certification[1]	1769-IT6
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

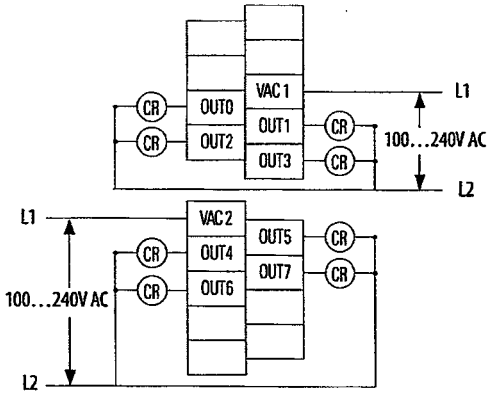
1769-OA8

Compact 100/240V AC solid-state output module

Simplified Output Circuit Diagram



1769-OA8



Technical Specifications - 1769-OA8

Attribute	1769-OA8
Outputs	8 (4 points/group)
Voltage category	100/240V AC
Operating voltage range	85...265V AC 47...63 Hz
Output delay, on[1]	1/2 cycle
Output delay, off[1]	1/2 cycle
Current draw @ 5.1V	145 mA
Heat dissipation, max	2.12 W
Off-state leakage current, max[2]	2.0 mA @ 132V AC 2.5 mA @ 265V AC
On-state current, max	10 mA
On-state voltage drop, max	1.5V peak @ 2 A
Current per point, max	0.25 A @ 60 °C 0.5 A @ 30 °C
Current per module, max	2 A @ 60 °C 4 A @ 30 °C
Surge current[3]	10 A for 25 ms, repeatable every 2 s
Isolation voltage	Verified by one of these dielectric tests: 1836V AC for 1 s or 2596V DC for 1 s, group to group 265V AC working voltage (basic insulation) 150V AC working voltage (IEC Class II reinforced insulation)
Weight, approx	280 g (0.61 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)

Technical Specifications - 1769-OA8

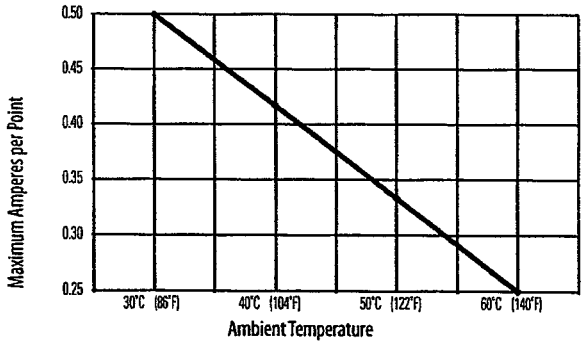
Attribute	1769-OA8
Replacement terminal block	1769-RTBN10 (1 per kit)
Replacement door label	1769-RL1 (2 per kit)
Replacement door	1769-RD (2 per kit)
Vendor ID code	1
Product type code	7
Product code	84
Enclosure type rating	None (open style)

(1) Triac outputs turn on and off at AC line zero cross.
(2) To limit the effects of leakage current through solid-state outputs, a loading resistor can be connected in parallel with your load. For 120V AC operation, use a 15 kΩ, 2 W resistor. For 240V AC operation, use a 5 kΩ, 5 W resistor.
(3) If you connect surge suppressors across your external load, you extend the life of the triac outputs.

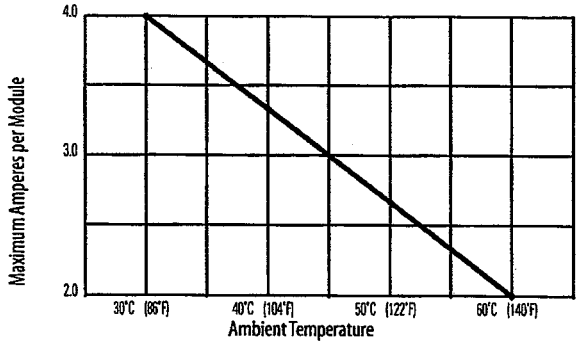
See Environmental Specifications - 1769 Compact I/O Modules on page 3.

Temperature Derating - 1769-OA8

1769-OA8 Maximum Amperes per Point Versus Temperature



1769-OA8 Maximum Amperes per Module Versus Temperature



Certifications - 1769-OA8

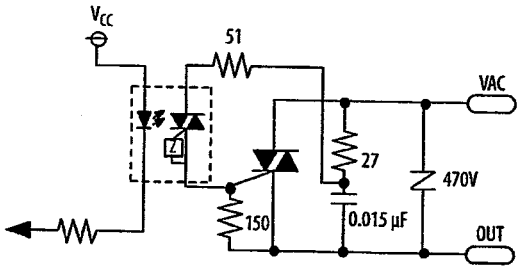
Certification[1]	1769-OA8
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions European Union 2014/35/EU LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

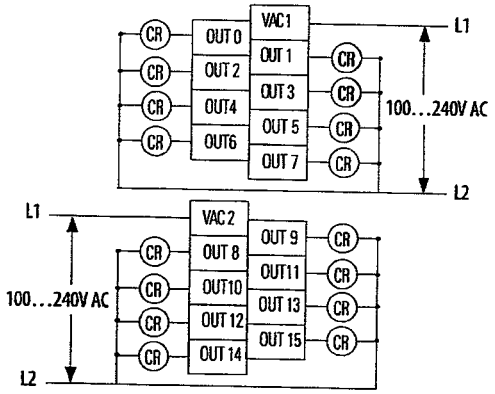
1769-OA16

Compact 120/240V AC solid-state output module

Simplified Output Circuit Diagram



1769-OA16



Technical Specifications - 1769-OA16

Attribute	1769-OA16
Outputs	16 (8 points/group)
Voltage category	100/240V AC
Operating voltage range	85...265V AC 47...63 Hz
Output delay, on[1]	1/2 cyde
Output delay, off[1]	1/2 cyde
Current draw @ 5.1V	225 mA
Heat dissipation, max	4.9 W
Off-state leakage current, max[2]	2.0 mA @ 132V AC 2.5 mA @ 265V AC
On-state current, max	10 mA
On-state voltage drop, max	1.5V peak @ 2 A
Current per point, max	0.25 A @ 60 °C 0.5 A @ 30 °C
Current per module, max	2 A @ 60 °C 4 A @ 30 °C
Surge current[3]	5 A for 25 ms, repeatable every 2 s
Isolation voltage	Verified by one of these dielectric tests: 1836V AC for 1 s or 2596V DC for 1 s, output point to bus • 265V AC working voltage (IEC Class II reinforced, basic insulation) • 150V AC working voltage (IEC Class II reinforced, basic insulation)
Weight, approx	280 g (0.61 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1.5
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)

Technical Specifications - 1769-OA16

Attribute	1769-OA16
Replacement terminal block	1769-RTBN18 (1 per kit)
Replacement door	Not available
Vendor ID code	1
Product type code	7
Product code	93
Enclosure type rating	None (open style)

(1) Triac outputs turn on and off at AC line zero cross.

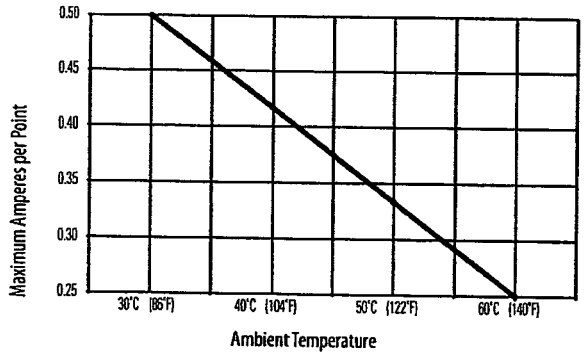
(2) To limit the effects of leakage current through solid-state outputs, a loading resistor can be connected in parallel with your load. For 120V AC operation, use a 15 kΩ, 2 W resistor. For 240V AC operation, use a 5 kΩ, 5 W resistor.

(3) If you connect surge suppressors across your external load, you extend the life of the triac outputs.

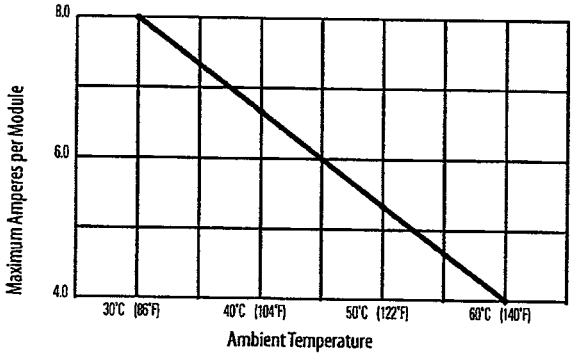
See Environmental Specifications - 1769 Compact I/O Modules on page 3.

Temperature Derating - 1769-0A16

1769-0A16 Maximum Amperes per Point Versus Temperature



1769-0A16 Maximum Amperes per Module Versus Temperature



Certifications - 1769-0A16

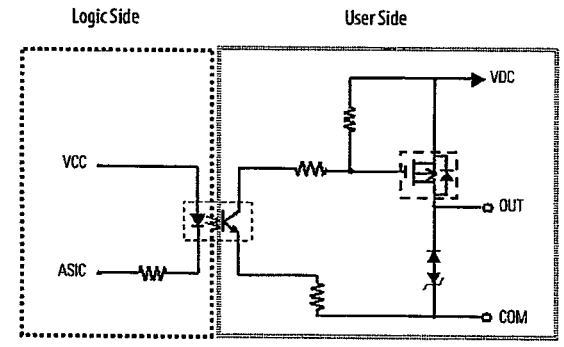
Certification[1]	1769-0A16
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions European Union 2014/35/EU LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

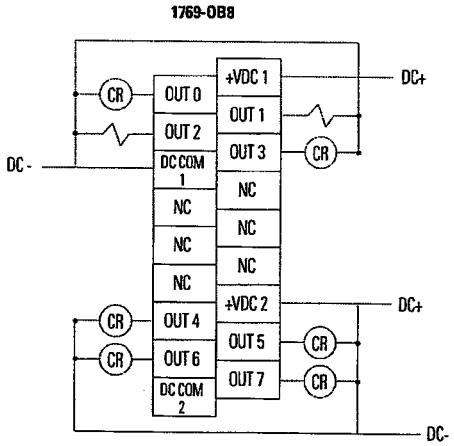
(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

1769-OB8

Compact solid-state 24V DC source, high-current output module

Simplified Output Circuit Diagram





Technical Specifications - 1769-OB8

Attribute	1769-OB8
Outputs	8 (4 points/group)
Voltage category	24V DC source
Operating voltage range	20.4...26.4V DC
Output delay, on	0.1 ms
Output delay, off	1.0 ms @ 60 °C max load 2 A, min V in 20.4V 1.5 ms @ 60 °C max load 1mA, min V in 20.4V
Current draw @ 5.1V	145 mA
Heat dissipation, max	2.20 W
Off-state leakage current, max[1]	1.0 mA @ 26.4V DC
On-state current, min	1.0 mA
On-state voltage drop, max	1.0V DC @ 2 A
Current per point, max	2.0 A @ 60 °C (140 °F)
Current per module, max	8.0 A @ 60 °C (140 °F)
Surge current[2]	4 A for 10 ms, repeatable every 2 s
Isolation voltage	Verified by one of these dielectric tests: 1200V AC for 1 s or 1697V DC for 1 s, output point to bus, and group to group 75V DC working voltage (IEC Class II reinforced insulation)
Weight, approx	280 g (0.61 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)

Technical Specifications - 1769-OB8

Attribute	1769-OB8
Replacement terminal block	1769-RTBN18 (1 per kit)
Replacement door label	1769-RL1 (2 per kit)
Replacement door	1769-RD (2 per kit)
Vendor ID code	1
Product type code	7
Product code	70
Enclosure type rating	None (open style)

(1) To limit the effects of leakage current through solid-state outputs, a loading resistor can be connected in parallel with your load. Use a 5.6 kΩ, 1/2 W resistor for transistor outputs, 24V DC operation.
(2) Use a 1N4004 diode reverse-wired across the load for transistor outputs switching 24V DC inductive loads.

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

Certifications - 1769-OB8

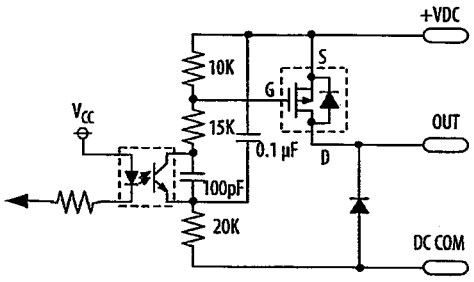
Certification[1]	1769-OB8
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

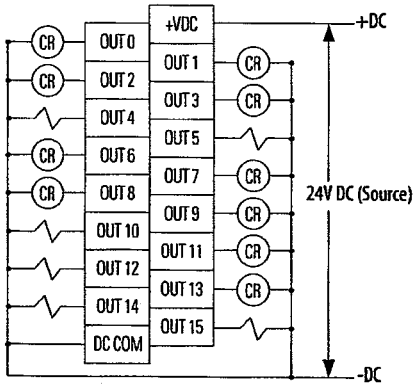
1769-OB16

Compact solid-state 24V DC source output module

Simplified Output Circuit Diagram



1769-OB16



Technical Specifications - 1769-OB16

Attribute	1769-OB16
Outputs	16 (16 points/group)
Voltage category	24V DC source
Operating voltage range	20.4...26.4V DC
Output delay, on	0.1 ms
Output delay, off	1.0 ms
Current draw @ 5.1V	200 mA
Heat dissipation, max	2.11 W
Off-state leakage current, max[1]	1.0 mA @ 26.4V DC
On-state current, min	1.0 mA
On-state voltage drop, max	1.0V DC @ 1 A
Current per point, max	0.5 A @ 60 °C (140 °F) 1.0 A @ 30 °C (86 °F)
Current per module, max	4.0 A @ 60 °C (140 °F) 8.0 A @ 30 °C (86 °F)
Surge current[2]	2.0 A for 10 ms, repeatable every 2 s
Isolation voltage	Verified by one of these dielectric tests: 1200V AC for 1 s or 1697V DC for 1 s, output point to bus 75V DC working voltage (IEC Class II reinforced insulation)
Weight, approx	280 g (0.61 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
Replacement terminal block	1769-RTBN18 (1 per kit)

Technical Specifications - 1769-OB16

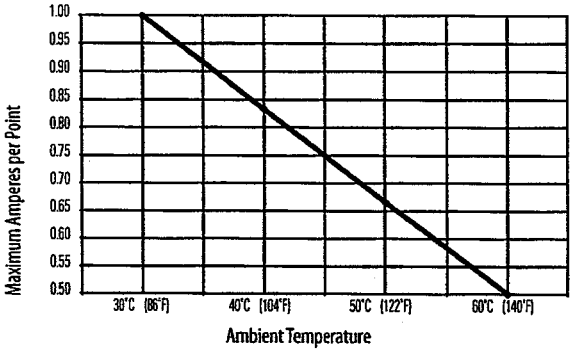
Attribute	1769-OB16
Replacement door label	1769-RL1 (2 per kit)
Replacement door	1769-RD (2 per kit)
Vendor ID code	1
Product type code	7
Product code	71
Enclosure type rating	None (open style)

(1) To limit the effects of leakage current through solid-state outputs, a loading resistor can be connected in parallel with your load. Use a 5.6 kΩ, 1/2 W resistor for transistor outputs, 24V DC operation.
(2) Use a 1N4004 diode reverse-wired across the load for transistor outputs switching 24V DC inductive loads.

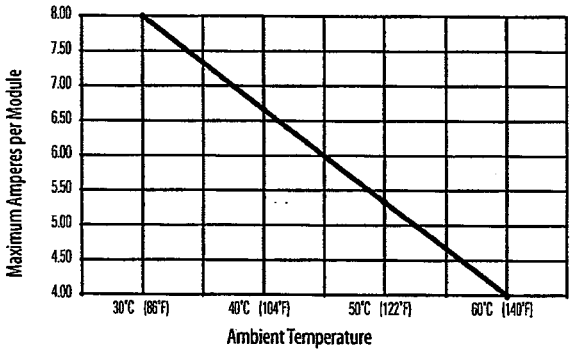
See Environmental Specifications - 1769 Compact I/O Modules on page 3.

Temperature Derating - 1769-0B16

1769-0B16 Maximum Amperes per Point Versus Temperature



1769-0B16 Maximum Amperes per Module Versus Temperature



Certifications - 1769-0B16

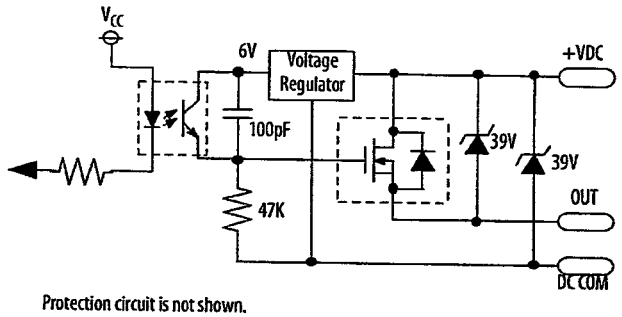
Certification[1]	1769-0B16
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

1769-OB16P

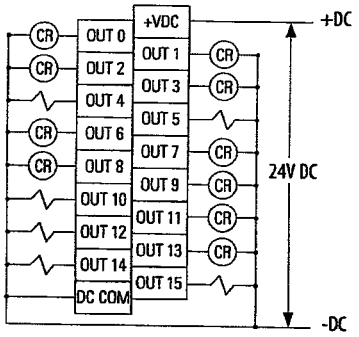
Compact solid-state 24V DC source, protected output module

Simplified Output Circuit Diagram



Protection circuit is not shown.

1769-OB16P



Technical Specifications - 1769-OB16P

Attribute	1769-OB16P
Outputs	16 (16 points/group)
Voltage category	24V DC source
Operating voltage range	20.4...26.4V DC
Output delay, on	1.0 ms
Output delay, off	2.0 ms
Current draw @ 5.1V	160 mA
Heat dissipation, max	2.69 W
Off-state leakage current, max[1]	1.0 mA @ 26.4V DC
On-state current, min	1.0 mA
On-state voltage drop, max	0.5V DC
Current per point, max	0.5 A @ 60 °C (140 °F) 1.0 A @ 30 °C (86 °F)
Current per module, max	4.0 A @ 60 °C (140 °F) 8.0 A @ 30 °C (86 °F)
Surge current[2]	2.0 A for 10 ms, repeatable every 1 s
Isolation voltage	Verified by one of these dielectric tests: 1200V AC for 1 s or 1697V DC for 1 s, output point to bus 75V DC working voltage (IEC Class II reinforced insulation)
Weight, approx	255 g (0.56 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)

Technical Specifications - 1769-OB16P

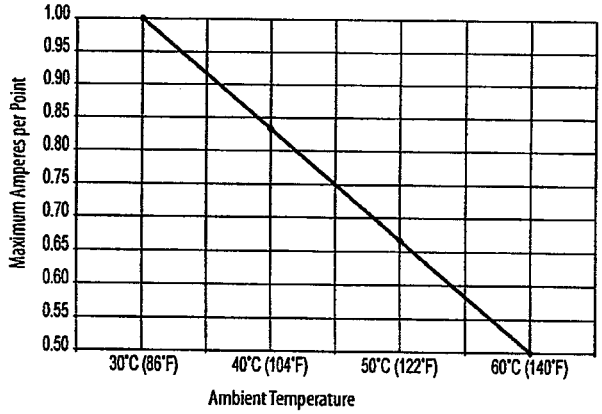
Attribute	1769-OB16P
Replacement terminal block	1769-RTBN18 (1 per kit)
Replacement door label	1769-RL1 (2 per kit)
Replacement door	1769-RD (2 per kit)
Vendor ID code	1
Product type code	7
Product code	91
Enclosure type rating	None (open style)

(1) To limit the effects of leakage current through solid-state outputs, a loading resistor can be connected in parallel with your load. Use a 5.6 kΩ, 1/2 W resistor for transistor outputs, 24V DC operation.
(2) Use a 1N4004 diode reverse-wired across the load for transistor outputs switching 24V DC inductive loads.

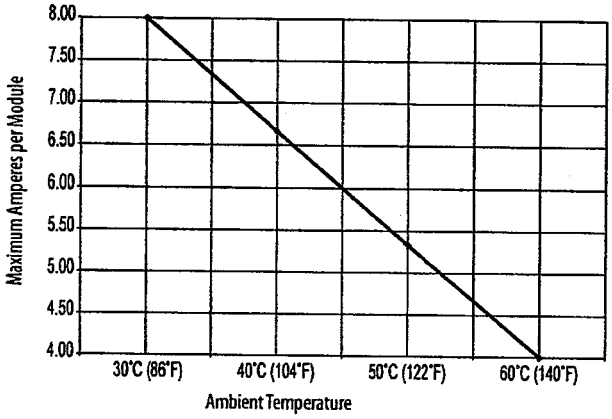
See Environmental Specifications - 1769 Compact I/O Modules on page 3.

Temperature Derating - 1769-OB16P

1769-OB16P Maximum Amperes per Point Versus Temperature



1769-OB16P Maximum Amperes per Module Versus Temperature



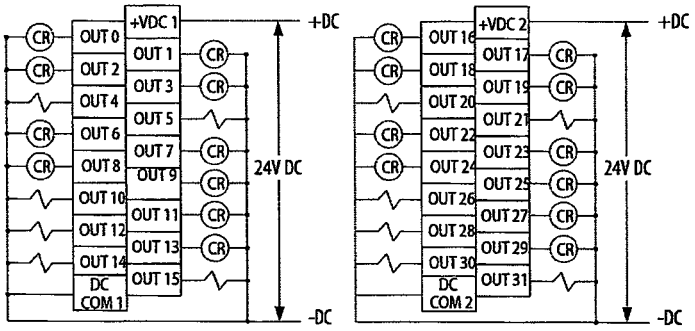
Certifications - 1769-OB16P

Certification[1]	1769-OB16P
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure

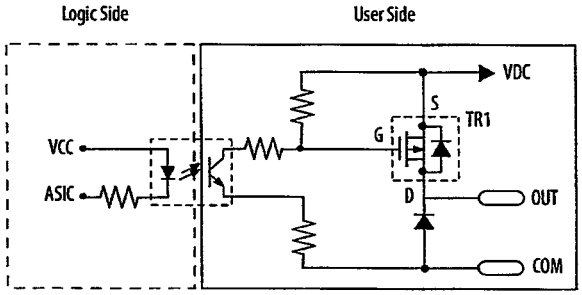
(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

1769-OB32

Compact solid-state 24V DC source output module



Simplified Output Circuit Diagram



Technical Specifications - 1769-OB32

Attribute	1769-OB32
Outputs	32 (16 points/group)
Voltage category	24V DC source
Operating voltage range	20.4...26.4V DC
Output delay, on	0.1 ms
Output delay, off	1.0 ms
Current draw @ 5.1V	300 mA
Heat dissipation, max	4.5 W
Off-state leakage current, max[1]	1.0 mA @ 26.4V DC
On-state current, min	1.0 mA
On-state voltage drop, max	1.0V DC @ 1 A
Current per point, max	0.5 A @ 60 °C (140 °F) 1.0 A @ 30 °C (86 °F)
Current per module, max	4.0 A @ 60 °C (140 °F) 8.0 A @ 30 °C (86 °F)
Surge current[2]	2.0 A for 10 ms, repeatable every 2 s
Isolation voltage	Verified by one of these dielectric tests: 1200V AC for 1 s or 1697V DC for 1 s, output point to bus 75V DC working voltage (IEC Class II reinforced insulation)
Weight, approx	450 g (0.992 lb)
Dimensions (HxWxD), approx	118 x 52.5 x 87 mm (4.65 x 2.07 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)

Technical Specifications - 1769-OB32

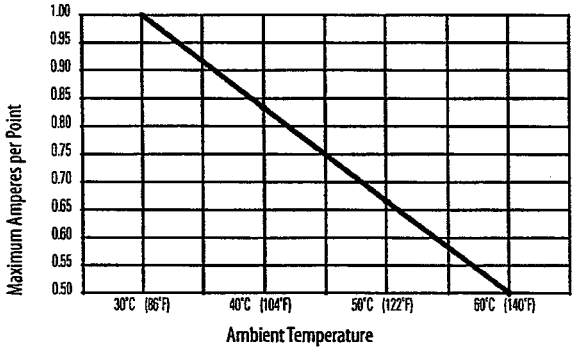
Attribute	1769-OB32
Slot width	1.5
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	6 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
Replacement terminal block	1769-RTBN18 (1 per kit)
Replacement door	Not available
Vendor ID code	1
Product type code	7
Product code	73
Enclosure type rating	None (open style)

(1) To limit the effects of leakage current through solid-state outputs, a loading resistor can be connected in parallel with your load. Use a 5.6 kΩ, 1/2 W resistor for transistor outputs, 24V DC operation.
(2) Use a 1N4004 diode reverse-wired across the load for transistor outputs switching 24V DC inductive loads.

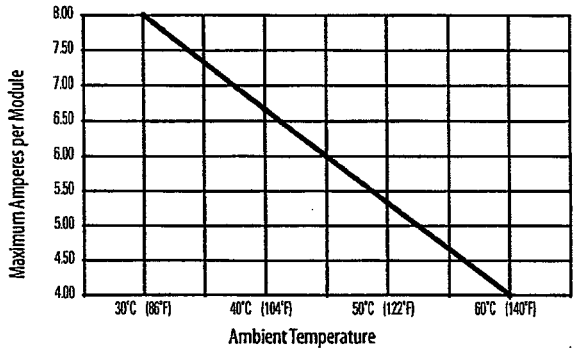
See Environmental Specifications - 1769 Compact I/O Modules on page 3.

Temperature Derating - 1769-OB32

1769-OB32 Maximum Amperes per Point Versus Temperature



1769-OB32 Maximum Amperes per Module Versus Temperature



Certifications - 1769-OB32

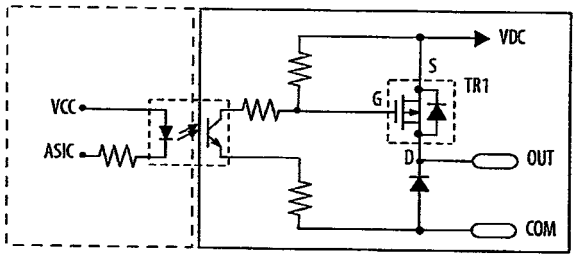
Certification[1]	1769-OB32
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

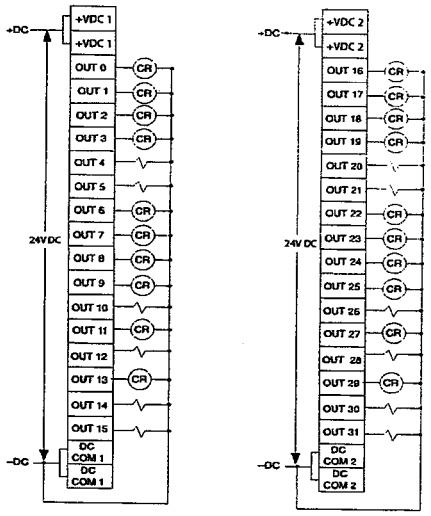
1769-OB32T

Compact solid-state 24V DC source, terminated output module

Simplified Output Circuit Diagram



1769-OB32T



Technical Specifications - 1769-OB32T

Attribute	1769-OB32T
Outputs	32 terminated (16 points/group)
Voltage category	24V DC source
Operating voltage range	10.2...26.4V DC
Output delay, on	0.5 ms
Output delay, off	4.0 ms
Current draw @ 5.1V	220 mA
Heat dissipation, max	4.76 W
Off-state leakage current, max[1]	0.1 mA @ 26.4V DC
On-state current, min	1.0 mA
On-state voltage drop, max	0.3V DC @ 0.5 A
Current per point, max	0.5 A
Current per module, max	4.0 A
Surge current[2]	2.0 A for 10 ms, repeatable every 2 s
Isolation voltage	Verified by one of these dielectric tests: 1200V AC for 2 s or 1697V DC for 2 s, output point to bus 75V DC working voltage (IEC Class II reinforced insulation)
Weight, approx	230 g (0.51 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)

Technical Specifications - 1769-OB32T

Attribute	1769-OB32T
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
Replacement connector	1746-N3 (1 connector, 40 terminals)
Vendor ID code	1
Product type code	7
Product code	79
Enclosure type rating	None (open style)

(1) To limit the effects of leakage current through solid-state outputs, a loading resistor can be connected in parallel with your load. Use a 5.6 kΩ, 1/2 W resistor for transistor outputs, 24V DC operation.
(2) Use a 1N4004 diode reverse-wired across the load for transistor outputs switching 24V DC inductive loads.

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

Certifications - 1769-OB32T

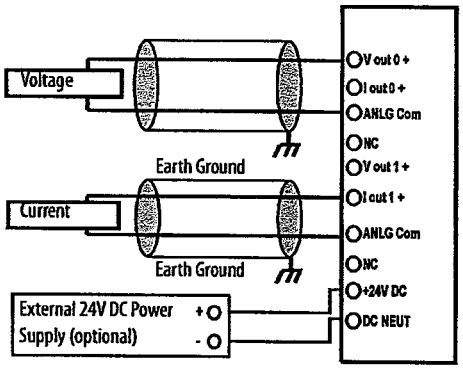
Certification[1]	1769-OB32T
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

1769-OF2

Compact voltage/current output analog module

1769-OF2



The external power supply must be rated Class 2, with a 24V DC range of 20.4...26.4V DC and 60 mA minimum. Series B and later modules support this option.

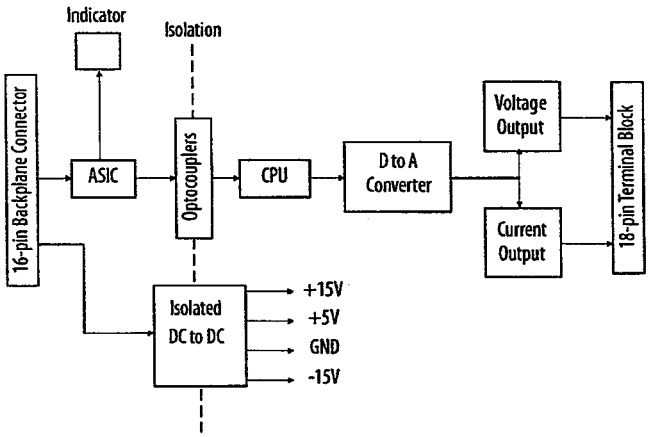
Technical Specifications - 1769-OF2

Attribute	1769-OF2
Outputs	2 single-ended
Output range	±10V 0...10V 0...5V 1...5V 0...20 mA 4...20 mA
Full scale range[1]	±10.5V -0.5...10.5V -0.5...5.25V 0.5...5.25V 0...21 mA 3.2...21 mA
Resolution	14 bits (unipolar) 14 bits plus sign (bipolar) ±10V DC: sign + 14 bits, 0.64 mV 0...10V DC: sign + 13 bits, 0.64 mV 0...5V DC: sign + 14 bits, 0.64 mV 1...5V DC: sign + 14 bits, 1.28 µA 0...20 mA: sign + 13 bits, 0.64 mV 4...20 mA: sign + 14 bits, 1.28 µA
Current draw @ 5.1V	120 mA
Current draw @ 24V	120 mA
Converter type	Delta Sigma
Heat dissipation, max	2.63 W
Conversion rate (all channels), max	2.5 ms
Step response to 63%[2]	2.9 ms
Current load on voltage output, max	10 mA
Resistive load on current output	0...500 Ω (includes wire resistance)
Load range on voltage output	> 1 kΩ @ 10V DC
Inductive load (current outputs), max	0.1 mH

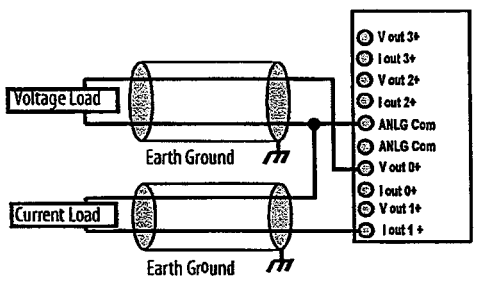
1769-OF4

Compact voltage/current output analog module

Simplified Schematic



1769-OF4



Technical Specifications - 1769-OF4

Attribute	1769-OF4
Outputs	4 single-ended
Output range	±10V 0…10V 0…5V 1…5V 0…20 mA 4…20 mA
Full scale range[1]	±10.5V -0.5…10.5V -0.5…5.25V 0.5…5.25V 0…21 mA 3.2…21 mA
Resolution	15 bits plus sign unipolar and bipolar
Current draw @ 5.1V	120 mA
Current draw @ 24V	170 mA
Heat dissipation, max	2.86 W
Conversion rate (all channels), max	Interrupts not enabled: 2.5 ms Interrupts enabled: 3.8 ms
Step response to 63%[2]	2.9 ms
Resistive load	Current: 0…600 Ω (includes wire resistance) Voltage: 1 KΩ or greater
Inductive load, max	0.1 mH (current load) 1.0 µF (voltage load)
Field calibration	None required
Accuracy[3]	0.5% full scale at 25 °C (77 °F)
Accuracy drift with temperature	±0.0086% of full scale per °C
Output ripple[4]	±0.05% @ 0…50 kHz
Nonlinearity	±0.05%

Technical Specifications - 1769-OF4

Attribute	1769-OF4
Repeatability(5)	±0.05%
Module error 0...60 °C (32...140 °F)	+/-0.8% of full scale
Output impedance	Voltage output: < 1 Ω Current output: > 1 MΩ
Open and short-circuit protection	Yes
Short-circuit protection, max	40 mA
Output overvoltage protection	Yes
Output response at system power up and power down	2.5...-1.0V DC spike for < 15 ms
Rated working voltage(6)	30V AC/30V DC
Isolation voltage	510V AC or 720V DC for 1 minute (qualification test), output group to bus 30V AC/30V DC working voltage (IEC Class II reinforced insulation)
Weight, approx	280 g (0.61 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
Replacement terminal block	1769-RTBN18 (1 per kit)
Replacement door label	1769-RL2 (2 per kit)
Replacement door	1769-RD (2 per kit)
Vendor ID code	1
Product type code	10
Product code	48
Input words	5
Output words	5
Configuration words	32
Enclosure type rating	None (open style)

(1) The over- or under-range flag comes on when the normal operating range (over/under) is exceeded. The module continues to convert the analog input up to the maximum full scale range. The flag automatically resets when within the normal operating range.
(2) Step response is the time between when the D/A converter was instructed to go from minimum to full range until the device is at 63% of full range.
(3) Includes offset, gain, drift, nonlinearity, and repeatability error terms.
(4) Output ripple is the amount that a fixed output varies with time, which assumes a constant load and temperature.
(5) Repeatability is the ability of the output module to reproduce output readings when the same controller value is applied to it consecutively, under the same conditions and in the same direction.
(6) Rated working voltage is the maximum continuous voltage that can be applied at the input terminal, including the input signal and the value that floats above ground potential. For example, a 10V DC input signal and 20V DC potential above ground at the input terminal.

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

Technical Specifications - 1769-0F2

Attribute	1769-0F2
Capacitive load (voltage outputs), max	1 µF
Field calibration	None required
Accuracy[3]	Voltage: ±0.5% full scale @ 25 °C (77 °F) Current: ±0.35% full scale @ 25 °C (77 °F)
Accuracy drift with temperature	Voltage: ±0.0086% per °C Current: ±0.0058% per °C
Output ripple[4]	±0.05% @ 0...50 kHz
Nonlinearity	±0.05%
Repeatability[5]	±0.05%
Module error	Voltage: ±0.8% Current: ±0.55%
Offset error	±0.05%
Output impedance	15 Ω
Open and short-circuit protection	Yes
Short-circuit protection, max	21 mA
Output overvoltage protection	Yes
Time to detect open wire condition (current mode)	10 ms, typical 13.5 ms, max
Output response at system powerup and power down	±5V DC spike for < 5 ms
Rated working voltage[6]	30V AC/30V DC
Isolation voltage	500V AC or 710V DC for 1 min (qualification test), output group to bus 30V AC/30V DC working voltage (IEC Class II reinforced insulation)
Weight, approx	300 g (0.65 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Optional 24V DC Class 2 power supply voltage range[7]	20.4...26.4V DC
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
Replacement terminal block	1769-RTBN18 (1 per kit)
Replacement door label	1769-RL2 (2 per kit)
Replacement door	1769-RD (2 per kit)
Vendor ID code	1
Product type code	10
Product code	32
Enclosure type rating	None (open style)

(1) The over- or under-range flag comes on when the normal operating range (over/under) is exceeded. The module continues to convert the analog input up to the maximum full scale range. The flag automatically resets when within the normal operating range.

(2) Step response is the time between when the D/A converter was instructed to go from minimum to full range until the device is at 63% of full range.

(3) Includes offset, gain, nonlinearity, and repeatability error terms.

(4) Output ripple is the amount that a fixed output varies with time, which assumes a constant load and temperature.
(5) Repeatability is the ability of the input module to register the same reading in successive measurements for the same input signal.
(6) Rated working voltage is the maximum continuous voltage that can be applied at the input terminal, including the input signal and the value that floats above ground potential. For example, a 10V DC input signal and 20V DC potential above ground at the input terminal.
(7) If the optional 24V DC Class 2 power supply is used, the 24V DC current draw from the bus is 0 mA.

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

Certifications - 1769-OF2

Certification[1]	1769-OF2
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

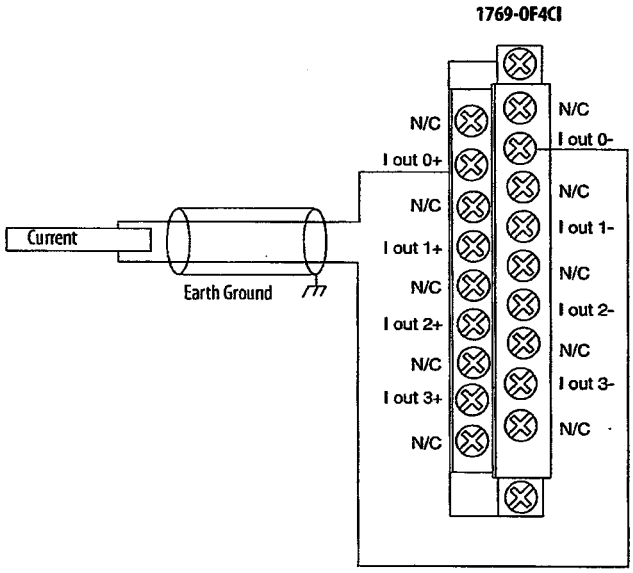
Certifications - 1769-OF4

Certification[1]	1769-OF4
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584 UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

1769-OF4CI

Compact current output, individually isolated analog module



Technical Specifications - 1769-OF4CI

Attribute	1769-OF4CI
Outputs	4 differential, individually isolated
Output range	0...20 mA 4...20 mA
Full scale range[1]	0...21 mA 3.2...21 mA
Resolution	16 bits (unipolar) 0...20 mA: 15.91 bits, 0.323 µA/bit 4...20 mA: 15.59 bits, 0.323 µA/bit
Bus current draw	5V DC, 145 mA 24V DC, 120 mA
Heat dissipation, max	2.68 W
Conversion rate (all channels), max	110 ms
Limited voltage/current[2]	< 2.9 ms
Resistive load on current output	0...500 Ω (includes wire resistance)
Inductive load (current outputs), max	0.1 mH
Field calibration	None required
Accuracy[3]	±0.35% full scale @ 25 °C (77 °F)
Accuracy drift with temperature	±0.0058% FS per °C
Output ripple[4]	±0.05% @ 0...50 kHz
Nonlinearity	±0.05%
Repeatability[5]	±0.05%
Module error	±0.55%
Output impedance	>1 MΩ
Open and short-circuit protection	Yes

Technical Specifications - 1769-OF4CI

Attribute	1769-OF4CI
Short-circuit protection, max	21 mA
Output overvoltage protection	Yes
Output response at system powerup and power down	No current glitch
Rated working voltage[6]	30V AC/30V DC
Isolation voltage	500V AC or 710V DC for 1 min (qualification test), output group to bus 30V AC/30V DC working voltage (IEC Class II reinforced insulation)
Weight, approx	270 g (0.60 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
Recommended cable	Belden 8761 (shielded)
Replacement terminal block	1769-RTBN18 (1 per kit)
Replacement door label	1769-RL2 (2 per kit)
Replacement door	1769-RD (2 per kit)
Vendor ID code	1
Product type code	10
Product code	45
Input words	6
Output words	5
Configuration words	32
Enclosure type rating	None (open style)

(1) The over- or under-range flag comes on when the normal operating range (over/under) is exceeded. The module continues to convert the analog input up to the maximum full scale range. The flag automatically resets when within the normal operating range.
(2) Step response is the time between when the D/A converter was instructed to go from minimum to full range until the device is at 63% of full range.
(3) Includes offset, gain, nonlinearity, and repeatability error terms.
(4) Output ripple is the amount that a fixed output varies with time, which assumes a constant load and temperature.
(5) Repeatability is the ability of the input module to register the same reading in successive measurements for the same input signal.
(6) Rated working voltage is the maximum continuous voltage that can be applied at the input terminal, including the input signal and the value that floats above ground potential. For example, a 10V DC input signal and 20V DC potential above ground at the input terminal.

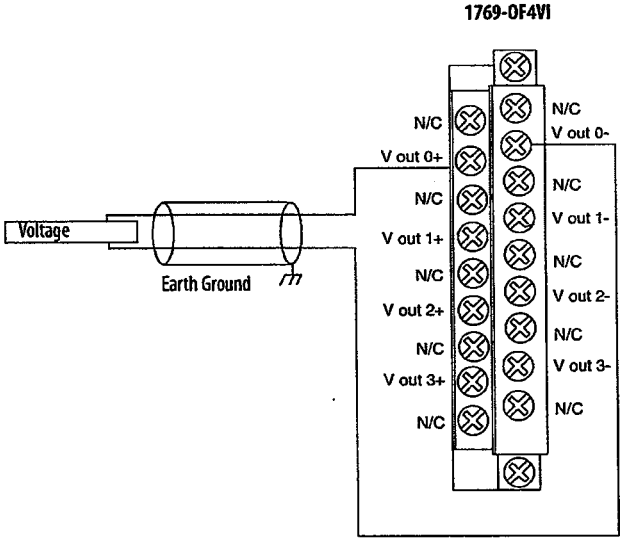
Certifications - 1769-OF4CI

Certification[1]	1769-OF4CI
c-UL	UL Listed Industrial Control Equipment, certified for US and Canada. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

1769-OF4VI

Compact voltage output, individually isolated analog module



Technical Specifications - 1769-OF4VI

Attribute	1769-OF4VI
Outputs	4 differential, individually isolated
Output range[1]	±10V DC 0...10V DC 0...5V DC 1...5V DC
Full scale range	±10.5V DC -0.5...10.5V DC -0.5...5.25V DC 0.5...5.25V DC
Resolution	15 bits plus sign (bipolar) ±10V DC: 15.89 bits, 330 µV/bit 0...10V DC: 14.89 bits, 330 µV/bit 0...5V DC: 13.89 bits, 330 µV/bit 1...5V DC: 13.57 bits, 330 µV/bit
Bus current draw	5V DC, 145 mA 24V DC, 120 mA
Heat dissipation, max	2.0 W (all points-10 V into 2 k - worst case calculated
Conversion rate (all channels), max	120 ms
Limited voltage/current[2]	< 2.9 ms
Load output current, max	5 mA
Load range output	>= 2 kΩ
Capacitive load (voltage outputs), max	1 µF
Field calibration	None required
Accuracy[3]	±0.5% full scale @ 25 °C (77 °F)
Accuracy drift with temperature	±0.0086% FS per °C
Output ripple[4]	±0.05% @ 0...50 kHz
Nonlinearity	±0.05%

Technical Specifications - 1769-OF4VI

Attribute	1769-OF4VI
Repeatability[5]	±0.05%
Module error	±0.8%
Output impedance	< 1Ω
Open and short-circuit protection	Yes
Short-circuit protection, max	35 mA typical 42 mA, max
Output overvoltage protection	Yes
Output response at system powerup and power down	Powerup: ±1.2V DC spike for < 0.4 ms Power down: ±1.2V DC spike for 21 ms
Rated working voltage[6]	30V AC/30V DC
Isolation voltage	500V AC or 710V DC for 1 min (qualification test), output group to bus 30V AC/30V DC working voltage (IEC Class II reinforced insulation)
Weight, approx	270 g (0.60 lbs)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
Recommended cable	Belden 8761 (shielded)
Replacement terminal block	1769-RTBN18 (1 per kit)
Replacement door label	1769-RL2 (2 per kit)
Replacement door	1769-RD (2 per kit)
Vendor ID code	1
Product type code	10
Product code	42
Input words	6
Output words	5
Configuration words	32
Enclosure type rating	None (open style)

(1) The over- or under-range flag comes on when the normal operating range (over/under) is exceeded. The module continues to convert the analog input up to the maximum full scale range. The flag automatically resets when within the normal operating range.
(2) Step response is the time between when the D/A converter was instructed to go from minimum to full range until the device is at 63% of full range.
(3) Includes offset, gain, nonlinearity, and repeatability error terms.
(4) Output ripple is the amount that a fixed output varies with time, which assumes a constant load and temperature.
(5) Repeatability is the ability of the input module to register the same reading in successive measurements for the same input signal.
(6) Rated working voltage is the maximum continuous voltage that can be applied at the input terminal, including the input signal and the value that floats above ground potential. For example, a 10V DC input signal and 20V DC potential above ground at the input terminal.

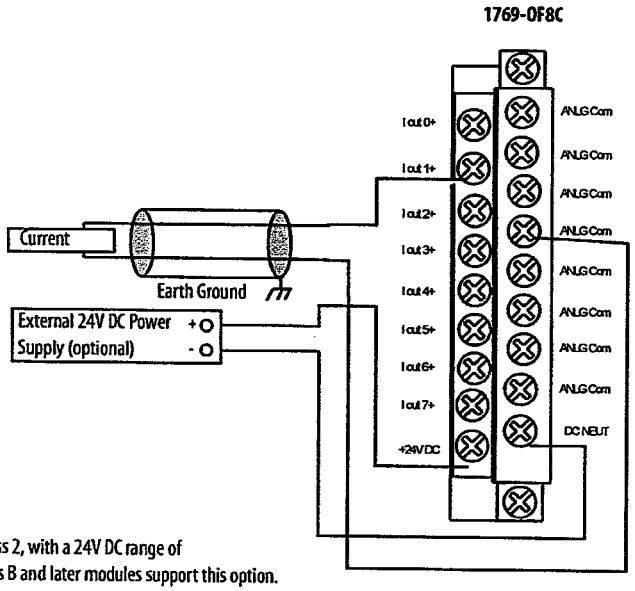
Certifications - 1769-OF4VI

Certification[1]	1769-OF4VI
c-UL	UL Listed Industrial Control Equipment, certified for US and Canada. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

1769-OF8C

Compact current output analog module



The external power supply must be rated Class 2, with a 24V DC range of 20.4...26.4V DC and 60 mA minimum. Series B and later modules support this option.

Technical Specifications - 1769-OF8C

Attribute	1769-OF8C
Outputs	8 single-ended
Output range	0...20 mA 4...20 mA
Full scale range[1]	0...21 mA 3.2...21 mA
Resolution	16 bits (unipolar) 0...20 mA: 15.91 bits, 0.323 µA/bit 4...20 mA: 15.59 bits, 0.323 µA/bit
Bus current draw	5V DC, 145 mA 24V DC, 185 mA
Heat dissipation, max	2.69 W
Conversion rate (all channels), max	5 ms
Step response to 63%[2]	< 2.9 ms
Resistive load on current output	0...500 Ω (includes wire resistance)
Inductive load (current outputs), max	0.1 mH
Field calibration	None required
Accuracy[3]	±0.35% full scale @ 25 °C (77 °F)
Accuracy drift with temperature	±0.0058% per °C
Output ripple[4]	±0.05% @ 0...50 kHz
Nonlinearity	±0.05%
Repeatability[5]	±0.05%
Module error	±0.55%
Offset error	±0.05%
Output impedance	> 1 MΩ

Technical Specifications - 1769-OF8C

Attribute	1769-OF8C
Open and short-circuit protection	Yes
Short-circuit protection, max	21 mA
Output overvoltage protection	Yes
Output response at system powerup and power down	±0.5V DC spike for < 5 ms
Rated working voltage(6)	30V AC/30V DC
Isolation voltage	500V AC or 710V DC for 1 min (qualification test), output group to bus 30V AC/30V DC working voltage (IEC Class II reinforced insulation)
Weight, approx	281 g (0.62 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Optional 24V DC Class 2 power supply voltage range(7)	20.4...26.4V DC
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
Replacement terminal block	1769-RTBN18 (1 per kit)
Replacement door label	1769-RL2 (2 per kit)
Replacement door	1769-RD (2 per kit)
Vendor ID code	1
Product type code	10
Product code	40
Input words	11
Output words	9
Configuration words	64
Enclosure type rating	None (open style)

(1) The over- or under-range flag comes on when the normal operating range (over/under) is exceeded. The module continues to convert the analog input up to the maximum full scale range. The flag automatically resets when within the normal operating range.
(2) Step response is the time between when the D/A converter was instructed to go from minimum to full range until the device is at 63% of full range.
(3) Includes offset, gain, nonlinearity, and repeatability error terms.
(4) Output ripple is the amount that a fixed output varies with time, which assumes a constant load and temperature.
(5) Repeatability is the ability of the input module to register the same reading in successive measurements for the same input signal.
(6) Rated working voltage is the maximum continuous voltage that can be applied at the input terminal, including the input signal and the value that floats above ground potential. For example, a 10V DC input signal and 20V DC potential above ground at the input terminal.
(7) If the optional 24V DC Class 2 power supply is used, the 24V DC current draw from the bus is 0 mA.

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

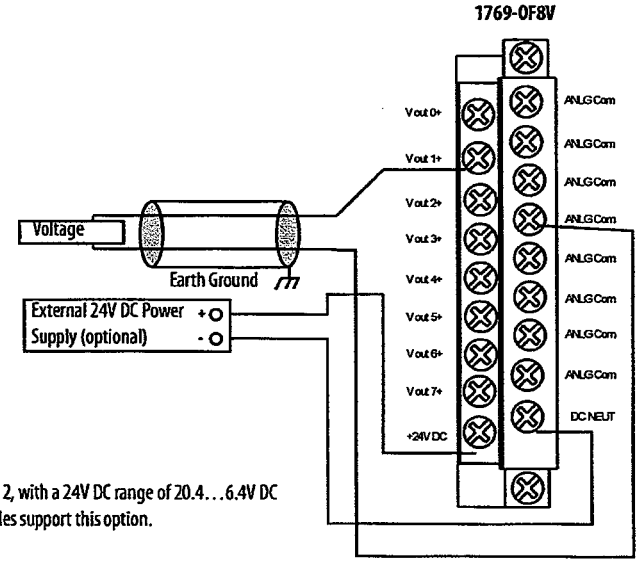
Certifications - 1769-OF8C

Certification[1]	1769-OF8C
c-UL	C-UL certified (under CSA C22.2 No. 142) UL Listed Industrial Control Equipment, certified for US and Canada. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

1769-OF8V

Compact voltage output analog module



The external power supply must be rated Class 2, with a 24V DC range of 20.4...6.4V DC and 60 mA minimum. Series B and later modules support this option.

Technical Specifications - 1769-OF8V

Attribute	1769-OF8V
Outputs	8 single-ended
Output range	±10V 0...10V 0...5V 1...5V
Full scale range[1]	±10.5V -0.5...10.5V -0.5...5.25V 0.5...5.25V
Resolution	16 bits plus sign (bipolar) ±10V DC: 15.89 bits, 330 µV/bit 0...10V DC: 14.89 bits, 330 µV/bit 0...5V DC: 13.89 bits, 330 µV/bit 1...5V DC: 13.57 bits, 330 µV/bit
Bus current draw	5V DC, 145 mA 24V DC, 135 mA
Heat dissipation, max	2.16 W
Conversion rate (all channels), max	5.0 ms
Step response to 63%[2]	< 2.9 ms
Load output current, max	10 mA
Load range output	> 1 kΩ
Capacitive load (voltage outputs), max	1 µF
Field calibration	None required
Accuracy[3]	±0.5% full scale @ 25 °C (77 °F)
Accuracy drift with temperature	±0.0086% per °C
Output ripple[4]	±0.05% @ 0...50 kHz
Nonlinearity	±0.05%
Repeatability[5]	±0.05%
Module error	±0.8%

Technical Specifications - 1769-OF8V

Attribute	1769-OF8V
Offset error	±0.05%
Output impedance	< 1 Ω
Open and short-circuit protection	Yes
Short-circuit protection, max	30 mA
Output overvoltage protection	Yes
Output response at system powerup and power down	± 0.5V DC spike for < 5 ms
Rated working voltage[6]	30V AC/30V DC
Isolation voltage	500V AC or 710V DC for 1 min (qualification test), output group to bus 30V AC/30V DC working voltage (IEC Class II reinforced insulation)
Weight, approx	263 g (0.58 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Optional 24V DC Class 2 power supply voltage range[7]	20.4...26.4V DC
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
Replacement terminal block	1769-RTBN18 (1 per kit)
Replacement door label	1769-RL2 (2 per kit)
Replacement door	1769-RD (2 per kit)
Vendor ID code	1
Product type code	10
Product code	39
Input words	11
Output words	9
Configuration words	64
Enclosure type rating	None (open style)

(1) The over- or under-range flag comes on when the normal operating range (over/under) is exceeded. The module continues to convert the analog input up to the maximum full scale range. The flag automatically resets when within the normal operating range.
(2) Step response is the time between when the D/A converter was instructed to go from minimum to full range until the device is at 63% of full range.
(3) Includes offset, gain, nonlinearity, and repeatability error terms.
(4) Output ripple is the amount that a fixed output varies with time, which assumes a constant load and temperature.
(5) Repeatability is the ability of the input module to register the same reading in successive measurements for the same input signal.
(6) Rated working voltage is the maximum continuous voltage that can be applied at the input terminal, including the input signal and the value that floats above ground potential. For example, a 10V DC input signal and 20V DC potential above ground at the input terminal.
(7) If the optional 24V DC Class 2 power supply is used, the 24V DC current draw from the bus is 0 mA.

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

Certifications - 1769-OF8V

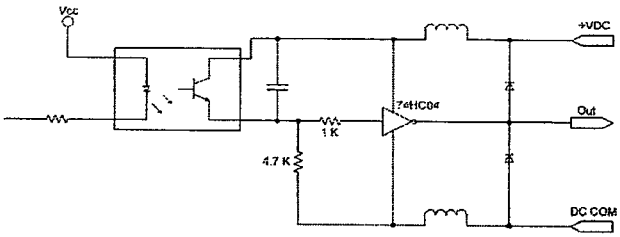
Certification[1]	1769-OF8V
c-UL	UL Listed Industrial Control Equipment, certified for US and Canada. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

1769-OG16

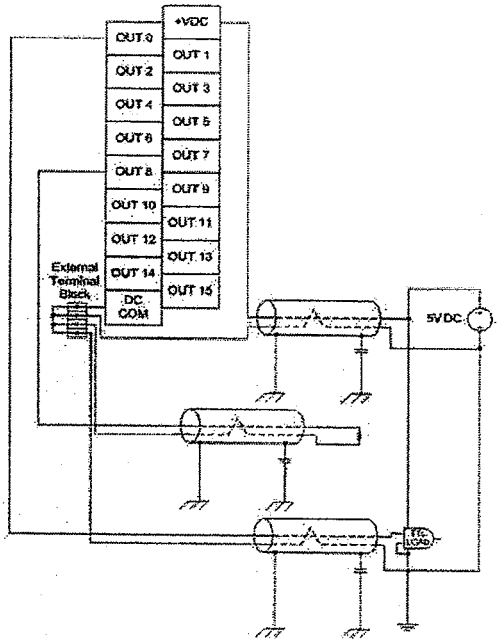
Compact TTL output module

Simplified Output Circuit Diagram



- Use Belden 8761, or equivalent, shielded wire.
- Do not connect more than two wires to any single terminal.
- Do not exceed 10 m (30 ft) with the DC power cable and I/O cables.
- The capacitors that are shown in the diagram must be 0.01 µF and rated for 2000V min.
- User power supply must be rated Class 2 with a 5V DC range of 4.5...5.5V DC.

1769-OG16



Low to True Format - 1769-OG16

- 0...0.4V DC = Output on-state is guaranteed
- 0.4...4.5V DC = Output state is not guaranteed
- 4.5...5.5V DC = Output off-state is guaranteed

Technical Specifications - 1769-OG16

Attribute	1769-OG16
Outputs	16
Voltage category	5V DC TTL (Low=True)[1]
Operating voltage range	4.5...5.5V DC 50 mV peak-to-peak ripple max
Output delay, off to on	0.25 ms
Output delay, on to off	0.50 ms
Current draw @ 5.1V	200 mA
Heat dissipation, max	1.2W
Off-state voltage, typical	4.5...5.5V DC
On-state voltage	0...0.4V DC
Load current, min	0.15 mA
Current per point, max	24 mA
Isolation voltage	Verified by one of these dielectric tests: 1200V AC for 2 s or 1697V DC for 2 s, output point to bus 75V DC working voltage (IEC Class II reinforced insulation)

Technical Specifications - 1769-OG16

Attribute	1769-OG16
Weight, approx	250 g (0.55 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
Vendor ID code	1
Product type code	7
Product code	78
Input words	1
Output words	1
Configuration words	5
Enclosure type rating	None (open-style)

(1) TTL inputs are inverted (-0.2...0.8 = low voltage = True = On.) Use a NOT instruction in your program to convert to traditional True = High logic.

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

Certifications - 1769-OG16

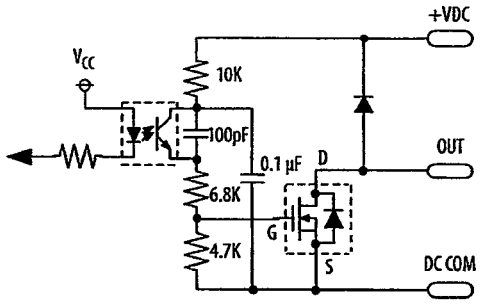
Certification[1]	1769-OG16
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

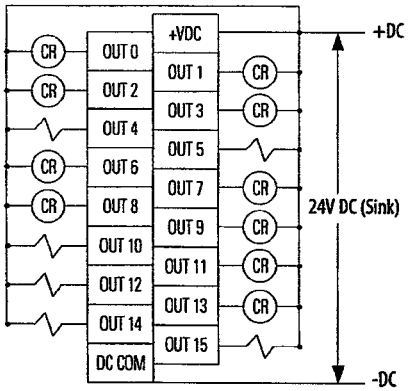
1769-OV16

Compact solid-state 24V DC sink output module

Simplified Output Circuit Diagram



1769-OV16



Technical Specifications - 1769-OV16

Attribute	1769-OV16
Outputs	16 (16 points/group)
Voltage category	24V DC sink
Operating voltage range	20.4...26.4V DC
Output delay, on	0.1 ms
Output delay, off	1.0 ms
Current draw @ 5.1V	200 mA
Heat dissipation, max	2.06 W
Off-state leakage current, max[1]	1.0 mA @ 26.4V DC
On-state current, min	1.0 mA
On-state voltage drop, max	1.0V DC @ 1 A
Current per point, max	0.5 A @ 60 °C (140 °F) 1.0 A @ 30 °C (86 °F)
Current per module, max	4.0 A @ 60 °C (140 °F) 8.0 A @ 30 °C (86 °F)
Surge current[2]	2.0 A for 10 ms, repeatable every 2 s
Isolation voltage	Verified by one of these dielectric tests: 1200V AC for 1 s or 1697V DC for 1 s, output point to bus 75V DC working voltage (IEC Class II reinforced insulation)
Weight, approx	280 g (0.61 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)

Technical Specifications - 1769-0V16

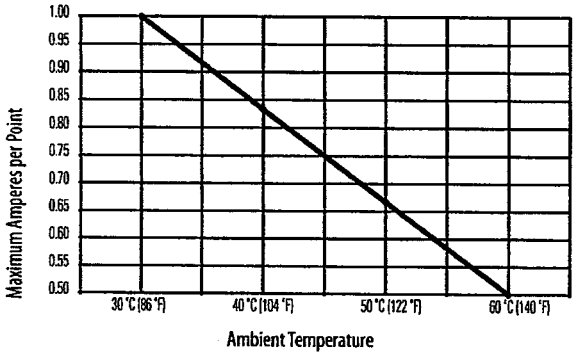
Attribute	1769-0V16
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
Replacement terminal block	1769-RTBN18 (1 per kit)
Replacement door label	1769-RL1 (2 per kit)
Replacement door	1769-RD (2 per kit)
Vendor ID code	1
Product type code	7
Product code	72
Enclosure type rating	None (open style)

(1) To limit the effects of leakage current through solid-state outputs, a loading resistor can be connected in parallel with your load. Use a 5.6 kΩ, 1/2 W resistor for transistor outputs, 24V DC operation.
(2) Use a 1N4004 diode reverse-wired across the load for transistor outputs switching 24V DC inductive loads.

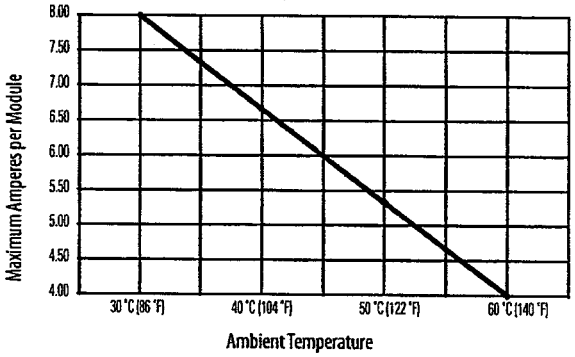
See Environmental Specifications - 1769 Compact I/O Modules on page 3.

Temperature Derating - 1769-OV16

1769-OV16 Maximum Amperes per Point Versus Temperature



1769-OV16 Maximum Amperes per Module Versus Temperature



Certifications - 1769-OV16

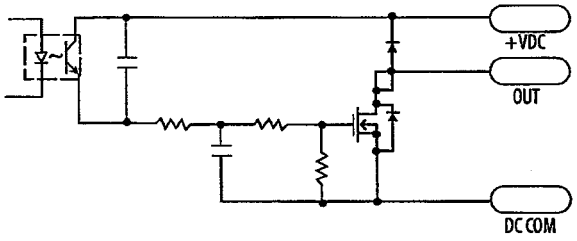
Certification[1]	1769-OV16
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

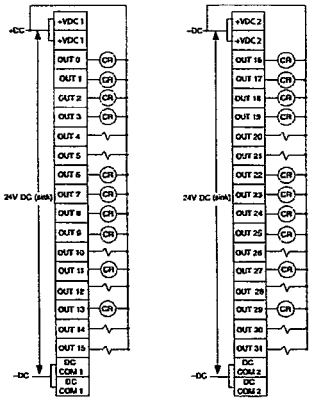
1769-OV32T

Compact solid-state 24V DC sink, terminated output module

Simplified Output Circuit Diagram



1769-OV32T



Technical Specifications - 1769-OV32T

Attribute	1769-OV32T
Outputs	32 terminated (16 points/group)
Voltage category	24V DC sink
Operating voltage range	10.2...26.4V DC
Output delay, on	< 16V, 1.5 ms >= 16V, 1.0 ms
Output delay, off	4.0 ms
Bus current draw	5V DC, 0.220 A 24V DC, 0 A
Heat dissipation, max	4.5W
Off-state leakage current, max[1]	1.0 mA @ 26.4V DC
On-state current, min	1.0 mA
On-state voltage drop, max	0.3V DC @ 0.5 A
Current per point, max	0.5 A
Current per module, max	4.0 A
Surge current[2]	2.0 A for 10 ms, repeatable every 2 s
Isolation voltage	Verified by one of these dielectric tests: 1200V AC for 1 s or 1697V DC for 1 s, output point to bus 75V DC working voltage (IEC Class II reinforced insulation)
Weight, approx	450 g (0.992 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)

Technical Specifications - 1769-OV32T

Attribute	1769-OV32T
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
Replacement connector	1746-N3 (1 connector, 40 terminals)
Vendor ID code	1
Product type code	7
Product code	75
Enclosure type rating	None (open style)

(1) To limit the effects of leakage current through solid-state outputs, a loading resistor can be connected in parallel with your load. Use a 5.6 kΩ, 1/2 W resistor for transistor outputs, 24V DC operation.
(2) Use a 1N4004 diode reverse-wired across the load for transistor outputs switching 24V DC inductive loads.

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

Certifications - 1769-OV32T

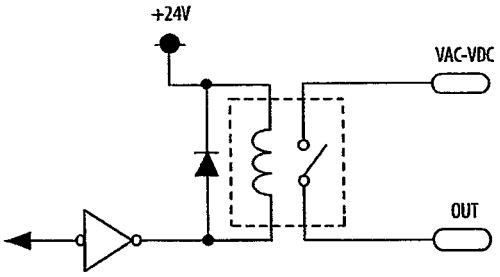
Certification[1]	1769-OV32T
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

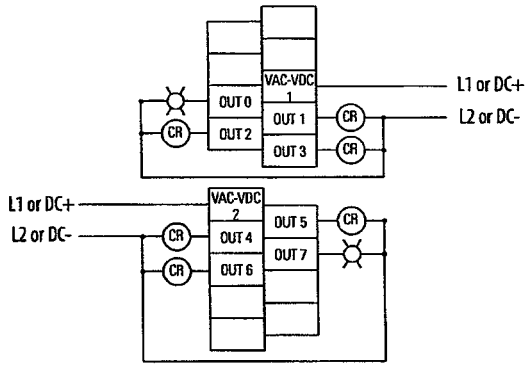
1769-OW8

Compact AC/DC relay contact module

Simplified Output Circuit Diagram



1769-OW8



Technical Specifications - 1769-OW8

Attribute	1769-OW8
Outputs	8 normally open (4 points/group)
Operating voltage range	5...265V AC 5...125V DC
Delay, on	10 ms
Delay, off	10 ms
Current draw @ 5.1V	125 mA
Current draw @ 24V	100 mA
Heat dissipation, max	2.83 W
Off-state leakage, max	0 mA
On-state current, min	10 mA @ 5V DC
Current per point, max	2.5 A
Current per module, max	16 A
Isolation voltage	Verified by one of these dielectric tests: 1836V AC for 1 s or 2596V DC for 1 s, output point to bus and group to group 265V AC working voltage (IEC Class II reinforced insulation)
Weight, approx	280 g (0.61 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
Replacement terminal block	1769-RTBN10 (1 per kit)

Technical Specifications - 1769-OW8

Attribute	1769-OW8
Replacement door label	1769-RL1 (2 per kit)
Replacement door	1769-RD (2 per kit)
Vendor ID code	1
Product type code	7
Product code	86
Enclosure type rating	None (open style)

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

Relay Contact Ratings - 1769-OW8

Volts, max	Continuous Amps per Point, max	Amperes[1]		Voltamperes		NEMA ICS2-125
		Make	Break	Make	Break	
240V AC	2.5 A	7.5 A	0.75 A	1800VA	180VA	C300
120V AC		15 A	1.5 A			
125V DC	1.0 A	0.22 A[2]		28VA		R150
24V DC	2.0 A	1.2 A[2]		28VA		—

(1) If you connect surge suppressors across your external inductive load, you extend the life of the relay contacts.

(2) For DC voltage applications, the make/break ampere rating for relay contacts can be determined by dividing 28VA by the applied DC voltage. For example, 28VA/48V DC = 0.58 A. For DC voltage applications less than 48V, the make/break ratings for relay contacts cannot exceed 2 A.

Certifications - 1769-OW8

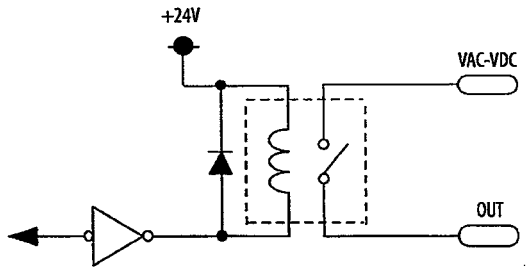
Certification[1]	1769-OW8
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions European Union 2014/35/EU LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

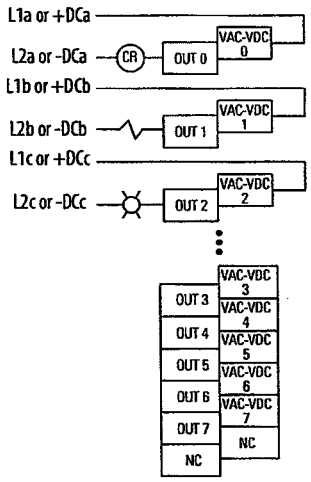
1769-OW8I

Compact AC/DC individually isolated, relay contact module

Simplified Output Circuit Diagram



1769-OW8I



Technical Specifications - 1769-OW8I

Attribute	1769-OW8I
Outputs	8 normally open, individually isolated (4 points/group)
Operating voltage range	5...265V AC 5...125V DC
Delay, on	10 ms
Delay, off	10 ms
Current draw @ 5.1V	125 mA
Current draw @ 24V	100 mA
Heat dissipation, max	2.83 W
Off-state leakage, max	0 mA
On-state current, min	10 mA @ 5V DC
Current per point, max	2.5 A
Current per module, max	16 A
Isolation voltage	Verified by one of these dielectric tests: 1836V AC for 1 s or 2596V DC for 1 s, output point to bus 265V AC working voltage (IEC Class II reinforced insulation) Verified by one of these dielectric tests: 1836V AC for 1 s or 2596V DC for 1 s, group to group 265V AC working voltage (basic insulation) 150V AC working voltage (IEC Class II reinforced insulation)
Weight, approx	290 g (0.64 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)

Technical Specifications - 1769-OW8I

Attribute	1769-OW8I
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
Replacement terminal block	1769-RTBN18 (1 per kit)
Replacement door label	1769-RL1 (2 per kit)
Replacement door	1769-RD (2 per kit)
Vendor ID code	1
Product type code	7
Product code	87
Enclosure type rating	None (open style)

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

Relay Contact Ratings - 1769-OW8I

Volts, max	Continuous Amps per Point, max	Amperes[1]		Voltamperes		NEMA ICS 2-125
		Make	Break	Make	Break	
240V AC	2.5 A	7.5 A	0.75 A	1800VA	180VA	C300
120V AC		15 A	1.5 A			
125V DC	1.0 A	0.22 A[2]		28VA		R150
24V DC	2.0 A	1.2 A[2]		28VA		—

(1) If you connect surge suppressors across your external inductive load, you extend the life of the relay contacts.

(2) For DC voltage applications, the make/break ampere rating for relay contacts can be determined by dividing 28VA by the applied DC voltage. For example, 28VA/48V DC = 0.58 A. For DC voltage applications less than 48V, the make/break ratings for relay contacts cannot exceed 2 A.

Certifications - 1769-OW8I

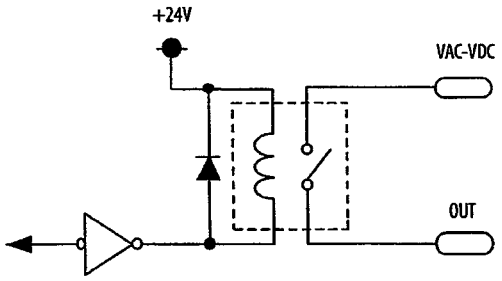
Certification[1]	1769-OW8I
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions European Union 2014/35/EU LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

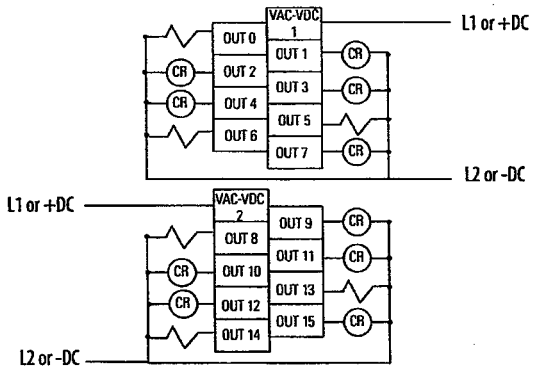
1769-OW16

Compact AC/DC relay contact module

Simplified Output Circuit Diagram



1769-OW16



Technical Specifications - 1769-OW16

Attribute	1769-OW16
Outputs	16 normally open (8 points/group)
Operating voltage range	5...265V AC 5...125V DC
Delay, on	10 ms
Delay, off	10 ms
Current draw @ 5.1V	205 mA
Current draw @ 24V	180 mA
Heat dissipation, max	4.75 W
Off-state leakage, max	0 mA
On-state current, min	10 mA @ 5V DC
Current per point, max	2.5 A
Current per module, max	20 A
Isolation voltage	Verified by one of these dielectric tests: 1836V AC for 1 s or 2596V DC for 1 s, output point to bus 265V AC working voltage (IEC Class II reinforced insulation) Verified by one of these dielectric tests: 1836V AC for 1 s or 2596V DC for 1 s, group to group 265V AC working voltage (basic insulation) 150V AC working voltage (IEC Class II reinforced insulation)
Weight, approx	450 g (0.99 lb)
Dimensions (HxWxD), approx	118 x 52.5 x 87 mm (4.65 x 2.07 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1.5
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)

Technical Specifications - 1769-OW16

Attribute	1769-OW16
Replacement terminal block	1769-RTBN18 (1 per kit)
Replacement door label	1769-RL1 (2 per kit)
Replacement door	1769-RD (2 per kit)
Vendor ID code	1
Product type code	7
Product code	85
Enclosure type rating	None (open style)

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

Relay Contact Ratings - 1769-OW16

Volts, max	Continuous Amps per Point, max	Amperes[1]		Voltamperes		NEMA ICS2-125
		Make	Break	Make	Break	
240V AC	2.5 A	7.5 A	0.75 A	1800VA	180VA	C300
120V AC		15 A	1.5 A			
125V DC	1.0 A	0.22 A[2]		28VA		R150
24V DC	2.0 A	1.2 A[2]		28VA		—

(1) If you connect surge suppressors across your external inductive load, you extend the life of the relay contacts.

(2) For DC voltage applications, the make/break ampere rating for relay contacts can be determined by dividing 28VA by the applied DC voltage. For example, 28VA/48V DC = 0.58 A. For DC voltage applications less than 48V, the make/break ratings for relay contacts cannot exceed 2 A.

Certifications - 1769-OW16

Certification[1]	1769-OW16
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions European Union 2014/35/EU LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
RCM	Australian Radiocommunications Act, compliant with: - AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

1769-ARM

Compact address reserve module

Use a 1769-ARM module to reserve module slots. To use the 1769-ARM module, first you create an I/O configuration and user program. Then you can remove and replace any module in the system with a 1769-ARM module after you inhibit the removed module in the programming software. If you inhibit a module, it creates an I/O configuration and user program that removes all references to that module.

To use the 1769-ARM module in MicroLogix systems, configure a generic module by using RSLogix 5000® programming software. Any user-program references to the slot position that is occupied by the 1769-ARM module must not use the parameters of another module.

Technical Specifications - 1769-ARM

Attribute	1769-ARM
Current draw @ 5.1V	60 mA
Current draw @ 24V	0 mA
Heat dissipation, max	0.3 W
Weight, approx	280 g (0.62 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Vendor ID code	1
Product type code	7
Product code	74
Enclosure type rating	None (open style)

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

Certifications - 1769-ARM

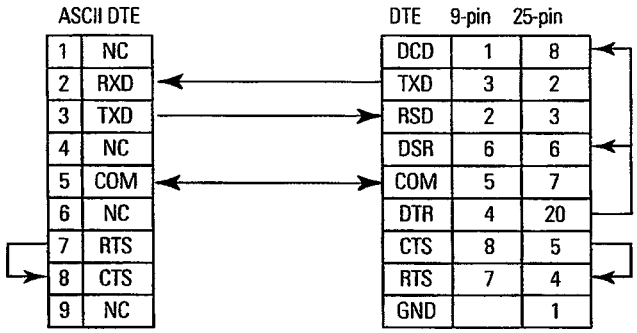
Certification[1]	1769-ARM
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

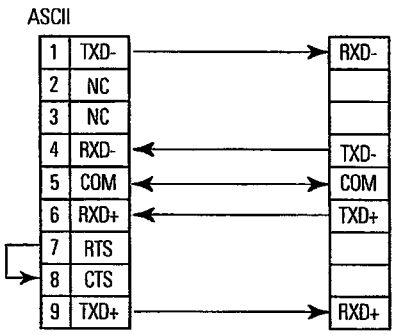
1769-ASCII

Compact ASCII module

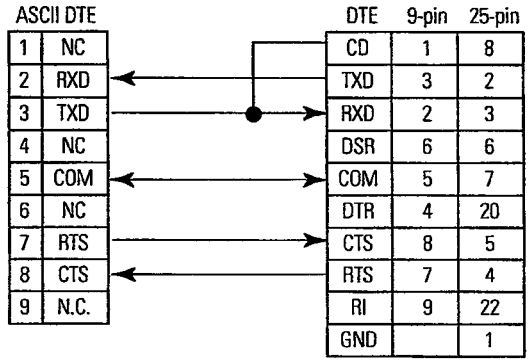
RS-232 Wiring Module to DTE Device (hardware handshaking disabled)



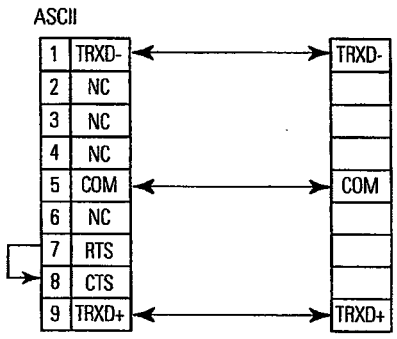
RS-422 Wiring



RS-232 Wiring - Module to Printer (hardware handshaking enabled, standard printer adapter cable)



RS-485 Wiring



Technical Specifications - 1769-ASCII

Attribute	1769-ASCII
Inputs	2 full-duplex (RS-232, RS-422) 2 half-duplex (RS-485)
Serial input voltage signal	3...25V DC with respect to signal ground (SG) 0, Asserted, ON, Space, Active -3...-25V DC with respect to signal ground (SG) 1, Disasserted, OFF, Mark, Inactive
Current draw @ 5.1V	425 mA
Current draw @ 24V	0 mA
Power dissipation, max	2.13 W
Thermal dissipation, max	7.3 BTU/hr
Isolation voltage	30V Tested to withstand 710V DC for 60 s
Transmit transaction ID	0...255
Handshaking	RTS/CTS hardware handshaking always enabled
Weight, approx	0.18 kg (0.40 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)

Technical Specifications - 1769-ASCII

Attribute	1769-ASCII
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	4 modules
Recommended cable	Belden 8761, shielded
Serial port connectors	Two DB-9 male with pins
Wire category	2 - on communication ports[1]
Vendor ID code	1
Product type code	109
Product code	66
Input words	108
Output words	108
Configuration words	31
Enclosure type rating	None (open style)

(1) Use this conductor category information for planning conductor routing as described in the system level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

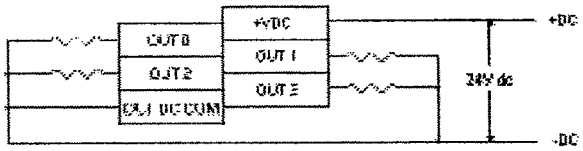
Certifications - 1769-ASCII

Certification[1]	1769-ASCII
c-UL-us	UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL file E194810.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

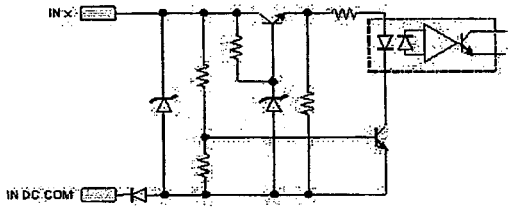
(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

1769-BOOLEAN

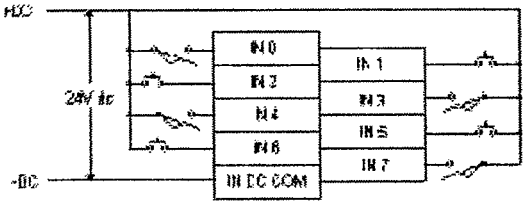
Compact combination 24V DC sink input/source output Boolean control module



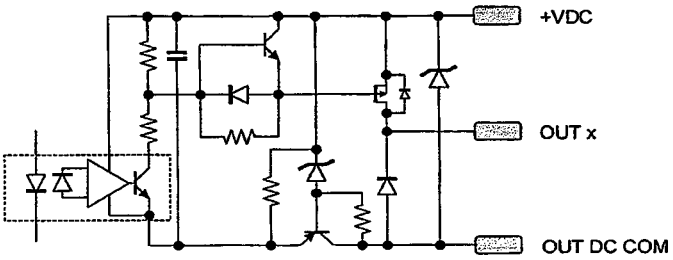
Simplified Input Schematic



Do not use the NC terminals as connection points.



Simplified Output Schematic



Technical Specifications - 1769-BOOLEAN

Attribute	1769-BOOLEAN
Current draw @ 5.1V	220 mA
Current draw @ 24V	0 mA
Heat dissipation, max	3.55 W
Closed loop time	Output on-state current ≥ 5 mA: 100 µs max Output on-state current < 5 mA: 150 µs max
Isolation voltage	Verified by one of these dielectric tests: 1200V AC for 1 s or 1697V DC for 1 s 75V DC working voltage (IEC Class II reinforced insulation)
Weight, approx	282 g (0.625 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)

Technical Specifications - 1769-BOOLEAN

Attribute	1769-BOOLEAN
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
Vendor ID code	1
Product type code	109
Product code	37
Enclosure type rating	None (open-style)

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

1769-BOOLEAN Input Specifications

Attribute	1769-BOOLEAN
Inputs	8 real 8 virtual
Voltage category	24V DC sinking
Operating voltage range	10...30V DC @ 30 °C (86 °F) 10...26V DC @ 60 °C (140 °F)
Digital filter, off to on	0 s, 100 µs, 200 µs, 500 µs, 1 ms, 2 ms, 4 ms, 8 ms
Digital filter, on to off	0 s, 100 µs, 200 µs, 500 µs, 1 ms, 2 ms, 4 ms, 8 ms
Input delay, off to on	10 µs
Input delay, on to off	10 µs
Current draw @ 5.1V	115 mA
Off-state voltage, max	5V DC
Off-state current, max	1.5 mA
On-state voltage, min	10V DC
On-state current, min	2 mA
Inrush current, max(1)	250 mA
Input impedance, max	2.0 kΩ @ 24V DC 2.3 kΩ @ 30V DC
IEC input compatibility	Type 1+
Isolation voltage	Verified by one of these dielectric tests: 1200V AC for 1 s or 1697V DC for 1 s, input point to bus 75V DC working voltage (IEC Class II reinforced insulation)

(1) A current limiting resistor can be used to limit inrush current; however, the operating characteristics of the AC input circuit are affected. If a 6.8 kΩ (2.5 W minimum) resistor is placed in series with the input, the inrush current is reduced to 35 mA. In this configuration, the minimum on-state voltage increases to 92V AC. Before adding the resistor in a hazardous environment, be sure to consider the operating temperature of the resistor and the temperature limits of the environment. The operating temperature of the resistor must remain below the temperature limit of the environment.

1769-BOOLEAN Output Specifications

Attribute	1769-BOOLEAN
Outputs	4
Voltage category	24V DC, sourcing
Operating voltage range	20.4...26.4V DC
Output delay, on(1)	10 µs, output on-state current ≥ 5 mA
Output delay, off(1)	10 µs, output on-state current ≥ 5 mA
Off-state leakage current, max(2)	1.0 mA @ 26.4V DC
On-state current, max	1.0 mA

1769-BOOLEAN Output Specifications

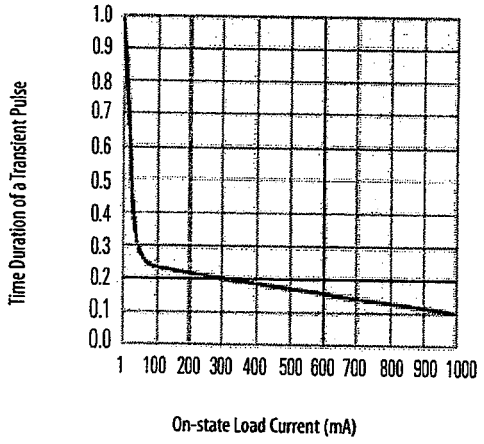
Attribute	1769-BOOLEAN
On-state voltage drop, max	1.0V DC @ 1 A
Current per point, max	0.5 A @ 60 °C (140 °F) 1.0 A @ 30 °C (86 °F)
Surge current[3]	2 A for 10 ms, repeatable every 2 s
Isolation voltage	Verified by one of these dielectric tests: 1200V AC for 1 s or 1697V DC for 1 s, output point to bus 75V DC working voltage (IEC Class II reinforced insulation)

(1) Triac outputs turn on and off at AC line zero cross.

(2) To limit the effects of leakage current through solid-state outputs, a loading resistor can be connected in parallel with your load. For 120V AC operation, use a 15 kΩ, 2 W resistor. For 240V AC operation, use a 5 kΩ, 5 W resistor.

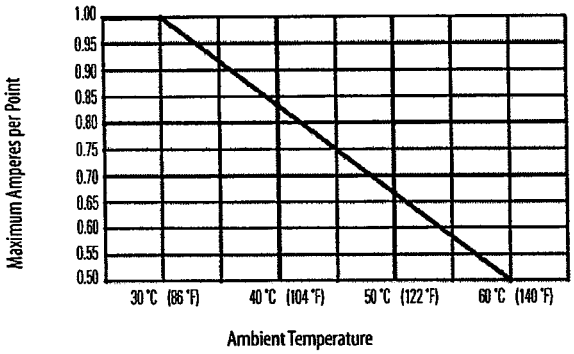
(3) If you connect surge suppressors across your external load, you extend the life of the triac outputs.

Transistor Output Transient Pulses - 1769-BOOLEAN

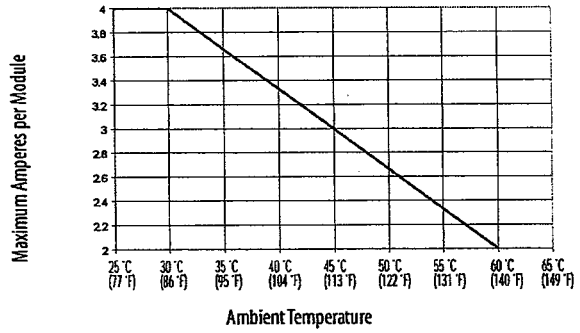


Temperature Derating - 1769-BOOLEAN

1769-BOOLEAN Maximum Amperes per Point Versus Temperature



1769-BOOLEAN Maximum Amperes per Module Versus Temperature



Certifications - 1769-BOOLEAN

Certification[1]	1769-BOOLEAN
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

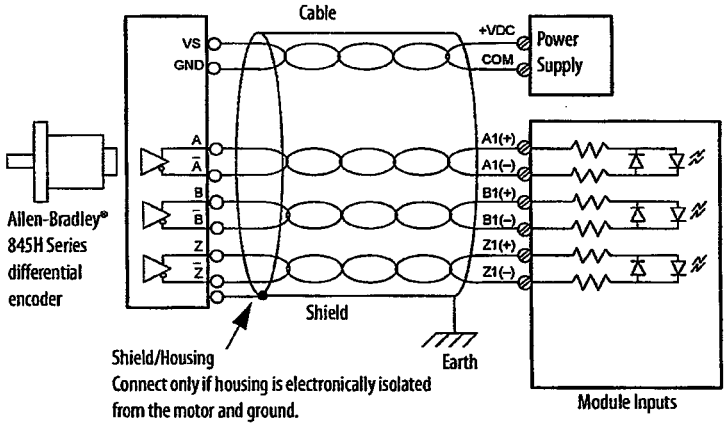
(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

1769-HSC

Compact high-speed counter module

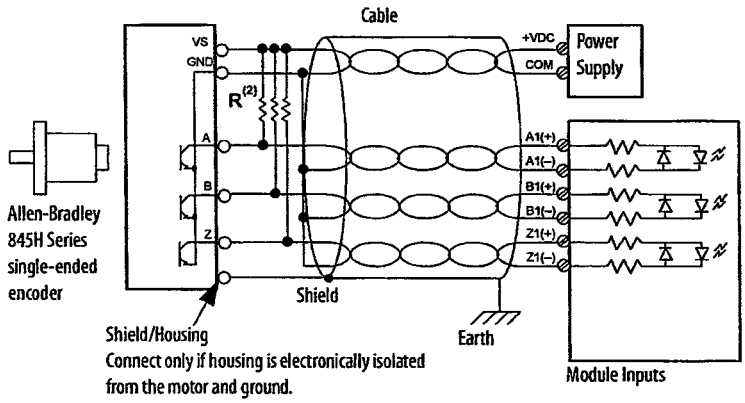
Differential Encoder Wiring

See the encoder manual for proper cable type. Use a twisted pair, individually shielded cable with a maximum length of 300 m (1000 ft).



Single-ended Encoder Wiring

See the encoder manual for proper cable type. Use a twisted pair, individually shielded cable with a maximum length of 300 m (1000 ft).



External resistors are required if they are not internal to the encoder. The pull-up resistor (R) value depends on the power supply value. To calculate the maximum resistor value, use this formula:

$$R = \frac{(Vdc - Vmin)}{Imin}$$

where:

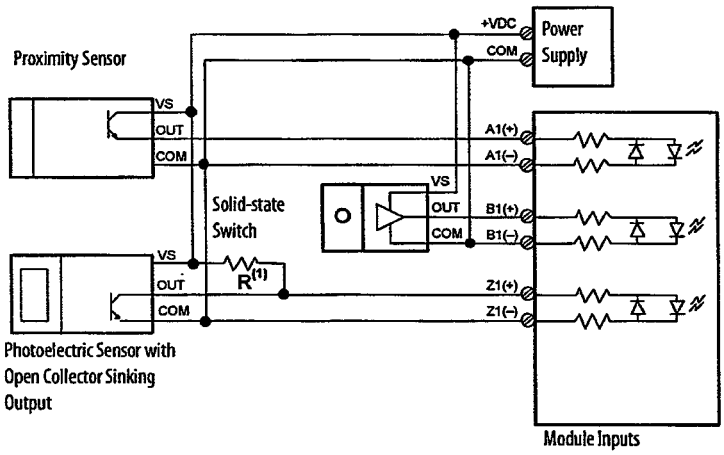
- R = maximum pull-up resistor value
- VDC = power supply voltage
- Vmin = 2.6V DC
- min = 6.8 mA

Power Supply Voltage (V DC)	Pull-up Resistor Value Max (R)(1)
5V DC	352 Ω
12V DC	1382 Ω
24V DC	3147 Ω

(1) Resistance values can change, depending upon your application.

The minimum resistor (R) value depends on the current sinking capability of the encoder.

Discrete Device Wiring



External resistors are required if they are not internal to the encoder. The pull-up resistor (R) value depends on the power supply value. To calculate the maximum resistor value, use this formula:

$$R = \frac{(Vdc - Vmin)}{Imin}$$

where:

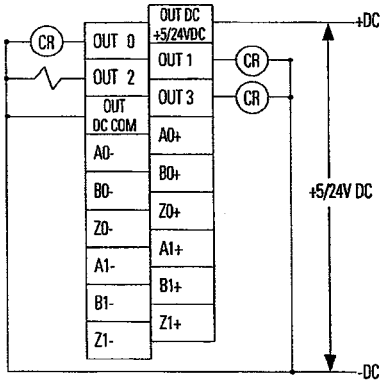
- R = maximum pull-up resistor value
- VDC = power supply voltage
- Vmin = 2.6V DC
- min = 6.8 mA

Power Supply Voltage (V DC)	Pull-up Resistor Value Max (R)(1)
5V DC	352 Ω
12V DC	1382 Ω
24V DC	3147 Ω

(1) Resistance values can change, depending upon your application.

The minimum resistor (R) value depends on the current sinking capability of the encoder.

Output Wiring



Technical Specifications - 1769-HSC

Attribute	1769-HSC
Bus current draw	425 mA, 5V DC 0 mA, 24V DC
Heat dissipation, max	6.21 W, the watts per point, plus the min watts, with all points energized
Isolation voltage	75V (continuous), reinforced insulation type, channel-to-system and channel-to-channel Type tested at 1200V AC for 2 s
Weight, approx	309 g (0.681 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	4 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	0.32…2.1 mm^2 (22…14 AWG) solid copper wire or 0.32…1.3 mm^2 (22…16 AWG) stranded copper wire rated at 90 °C (194 °F) insulation max
Wire type	Cu-90 °C (194 °F)
Recommended cable	Individually shielded, twisted-pair cable (or the type recommended by the encoder or sensor manufacturer)
Wiring Category(1)	2 - on signal ports
Vendor ID code	1
Product type code	109
Product code	19
Enclosure type rating	None (open-style)

(1) Use this Conductor Category information for planning conductor routing. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

1769-HSC Input Specifications

Attribute	1769-HSC
Inputs	2 quadrature (ABZ) differential inputs
Input voltage range(1)	2.6…30V DC
On-state voltage, max	30V DC
On-state voltage, min	2.6V DC
On-state current, min	6.8 mA
Off-state voltage, max	1.0V DC
Off-state current, max	1.5 mA
Off-state leakage current, max	1.5 mA
Input current, max	15 mA
Input current, min	6.8 mA
Input impedance	1950 Ω
Pulse width, min	250 ns
Phase separation, min	131 ns
Input frequency, max	1 MHz
Isolation voltage	Verified by one of these dielectric tests: 1200V AC or 1697V DC for 1 s, input to bus and input to input 75V DC working voltage (IEC Class II reinforced insulation)

(1) See Compact I/O Modules Installation Instructions, publication 1769-IN088.

1769-HSC Output Specifications

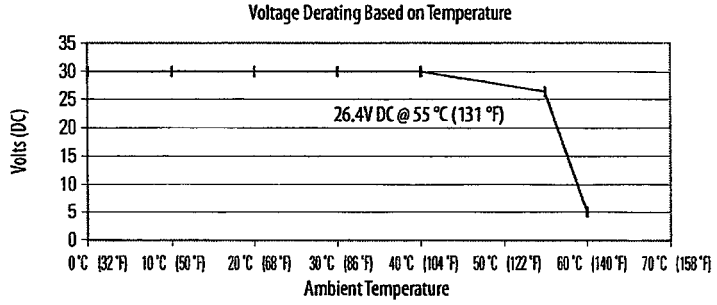
Attribute	1769-HSC
Outputs	16 total, 4 physical and 12 virtual
Output voltage range	5...30V DC
On-state voltage, max	User power - 0.1V DC
On-state output current per point, max	1 A, 30V DC, 40 °C 0.5A, 5V DC, 60 °C
On-state output current per module, max	4 A, 30V DC, 40 °C 2A, 5V DC, 60 °C
On-state output current, min	1 mA
On-state voltage drop, max	0.5V DC
Off-state leakage current, max	5 µA
Turn-on time, max	400 µs(1)
Turn-off time, max	200 µs
Reverse polarity protection	30V DC
Isolation voltage	Verified by one of these dielectric tests: 1200V AC or 1697V DC for 1 s, output to bus 75V DC working voltage (IEC Class II reinforced insulation)

(1) Maximum turn-on time applies to output voltage range of 5...7V DC. For output voltages greater than 7V DC, the maximum turn-on time is 200 µs.

See Environmental Specifications - 1769 Compact I/O Modules on page 3.

Temperature Derating - 1769-HSC

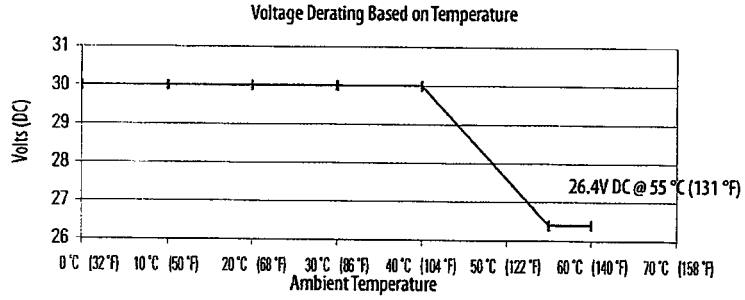
Maximum Input Voltage - 24V DC Operation



Temperature	Derated Voltage(1)
0...40 °C (32...104 °F)	30V DC
55 °C (131 °F)	26.4V DC
60 °C (140 °F)	5V DC

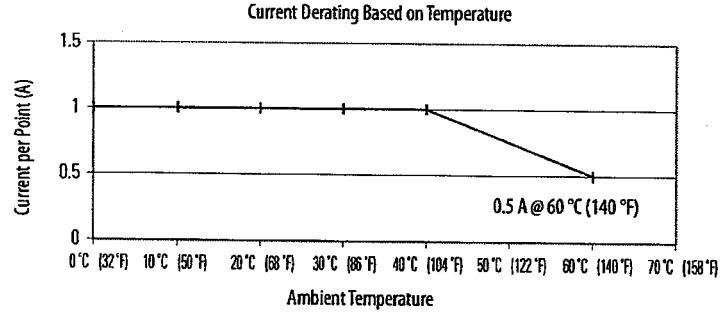
(1) Input voltage derating between 55...60°C is achieved by using a dropping resistor.
For 24V DC input voltage, use a 2.4 kΩ, ½ Watt resistor.
For input voltages other than 24V DC, use a ½ Watt resistor with value: 125 x (V_{in} - 5V).

Maximum Output Voltage - 24V DC Operation



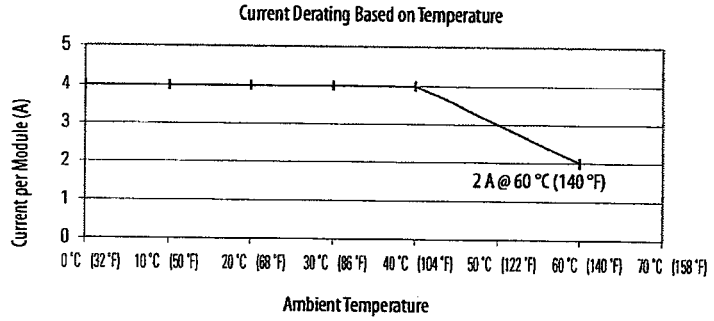
Temperature	Derated Voltage
0...40 °C (32...104 °F)	30V DC
55...60 °C (131...140 °F)	26.4V DC

Maximum Output Current per Point - 5V DC Operation



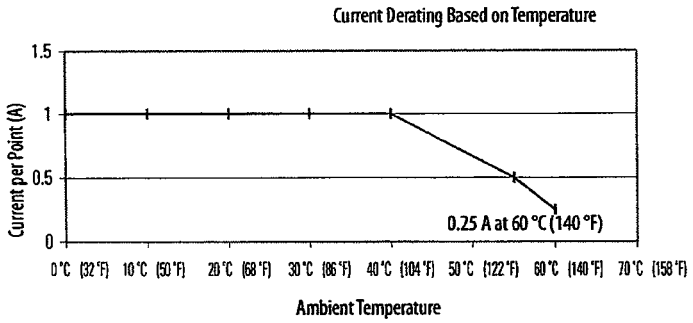
Temperature	Derated Current
0...40 °C (32...104 °F)	1 A
60 °C (140 °F)	0.5 A

Maximum Output Current per Module - 5V DC Operation



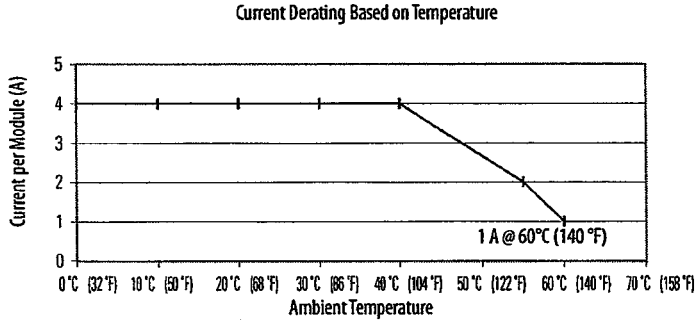
Temperature	Derated Current
0...40 °C (32...104 °F)	4 A
60 °C (140 °F)	2 A

Maximum Output Current per Point - 24V DC Operation



Temperature	Derated Current
0...40 °C (32...104 °F)	1 A
55 °C (131 °F)	0.5 A
60 °C (140 °F)	0.25 A

Maximum Output Current per Module - 24V DC Operation



Temperature	Derated Current
0...40 °C (32...104 °F)	4 A
55 °C (131 °F)	2 A
60 °C (140 °F)	1 A

Certifications - 1769-HSC

Certification[1]	1769-HSC
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

Compact I/O Accessories

Category	Cat. No.	Description
End cap	1769-ECL	Left-end cap for Compact I/O system
	1769-ECR	Right-end cap for Compact I/O system
Expansion cable	1769-CLL1	Left bank-to-left bank expansion 305 mm (1 ft)
	1769-CLL3	Left bank-to-left bank expansion 1 m (3.28 ft)
	1769-CRR1	Right bank-to-right bank expansion 305 mm (1 ft)
	1769-CRR3	Right bank-to-right bank expansion 1 m (3.28 ft)
	1769-CRL1	Right bank-to-left bank expansion 305 mm (1 ft)
	1769-CRL3	Right bank-to-left bank expansion 1 m (3.28 ft)
Replacement terminal block	1769-RTBN10	10-pin NEMA terminal block
	1769-RTBN18	18-pin NEMA terminal block
Replacement door labels	1769-RL1	Replacement door labels for digital I/O, 2 per kit
	1769-RL2	Replacement door labels for analog and specialty I/O, 2 per kit
Replacement doors	1769-RD	Door replacement kit, 2 per kit
Replacement connector kit	1746-N3	Connector kit to terminate a cable, which connects field I/O devices to 32-point I/O modules, 1 connector and 40 terminals

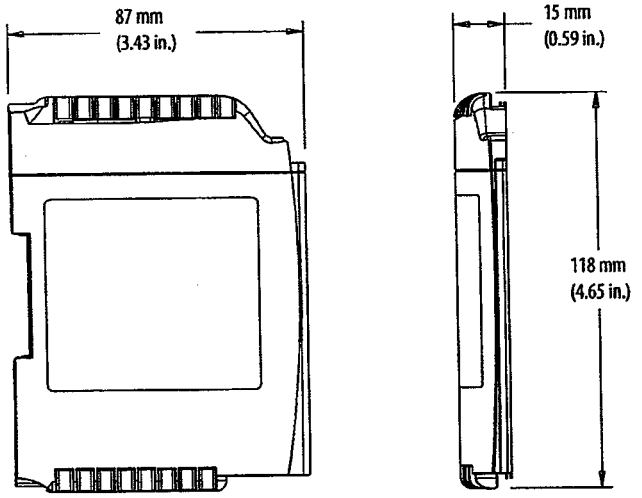
End Caps

The final I/O bank in Compact system needs an end cap on the end without the expansion cable. The 1769-L23*x* controller comes with a right-end cap, so you do not need to order one separately.

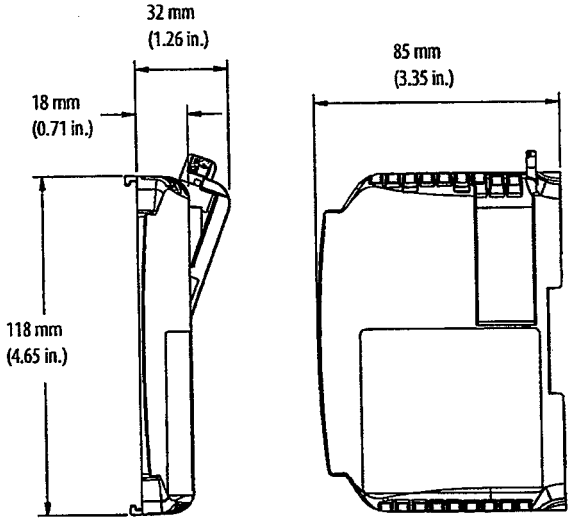
Technical Specifications - 1769-ECL, 1769-ECR

Attribute	1769-ECL	1769-ECR
Current draw @ 5.1V	5 mA	
Current draw @ 24V	0 mA	
Weight, approx	130 g (0.286 lb)	
Location	Left end	Right end
North American temperature code	T3C	
IEC temperature code	N/A	T4
Enclosure type rating	None (open-style)	None (open-style)

Mounting Dimensions - 1769-ECL



Mounting Dimensions - 1769-ECR



Certifications - 1769-ECL, 1769-ECR

Certification[1]	1769-ECL	1769-ECR
c-UL-us	UL Listed for Class I, Division 2 Group A, B, C, D Hazardous Locations, certified for U.S. and Canada. See UL File E10314	
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions	CE
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure	—
ATEX	—	European Union 2014/34/EU ATEX Directive, compliant with: EN 60079-0; General Requirements EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • II 3 G Ex nA IIC T4 Gc

(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

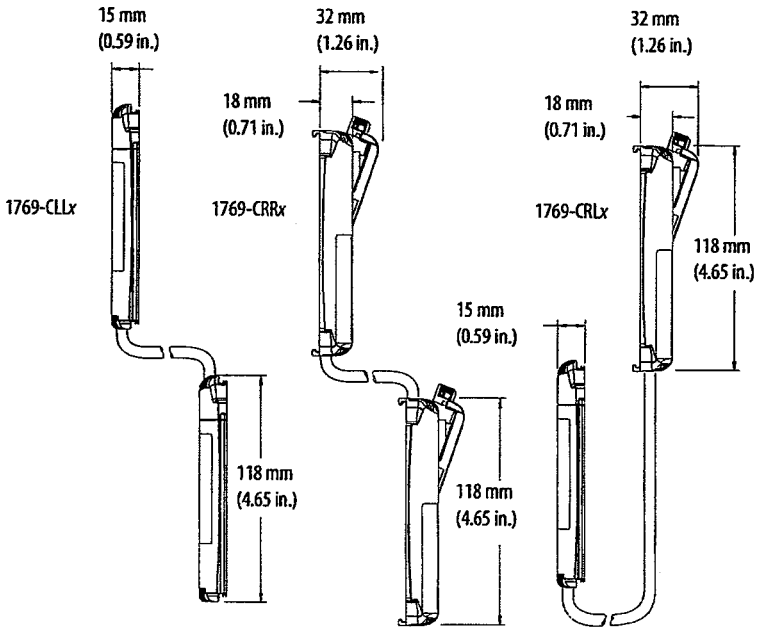
Expansion Cables

The 1769-CLL*x*, -CRR*x*, and -CRL*x* cables extend the 1769 bus communication lines. A maximum of two cables can be used in a 1769 system, which allows for three groups or banks of I/O modules. Each bank requires its own power supply.

Technical Specifications - 1769-CLL*x*, 1769-CRR*x*, 1769-CRL*x*

Attribute	1769-CLL1, 1769-CRR1, 1769-CRL1	1769-CLL3, 1769-CRR3, 1769-CRL3
Weight, approx	300 g (0.66 lb)	350 g (0.77 lb)
Length	305 mm (1 ft)	1 m (3.28 ft)

Dimensions - 1769-CLL*x*, 1769-CRR*x*, 1769-CRL*x*



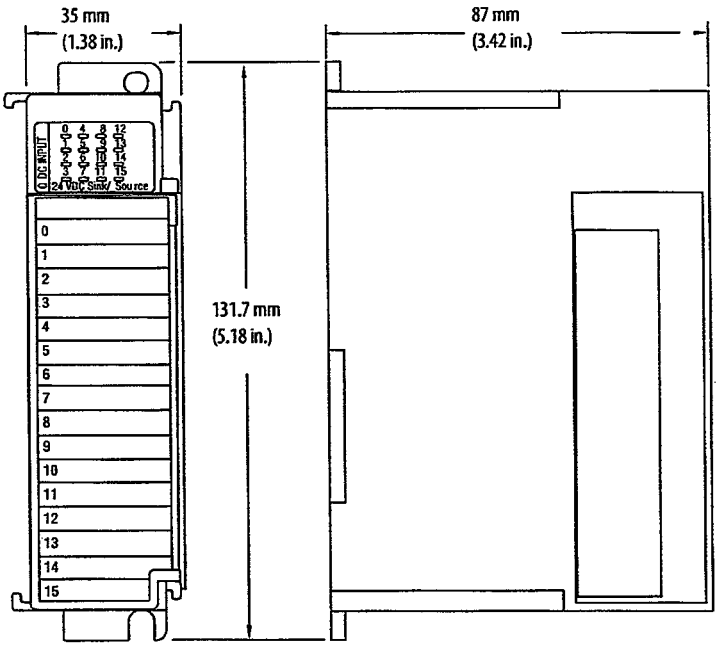
Certifications - 1769-CLL*x*, 1769-CRR*x*, 1769-CRL*x*

Certification[1]	1769-CLL*x*, 1769-CRR*x*, 1769-CRL*x*
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.
CE	European Union 2014/30/EU EMC Directive, compliant with: • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
RCM	Australian Radiocommunications Act, compliant with: • AS/NZS CISPR 11; Industrial Enclosure
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

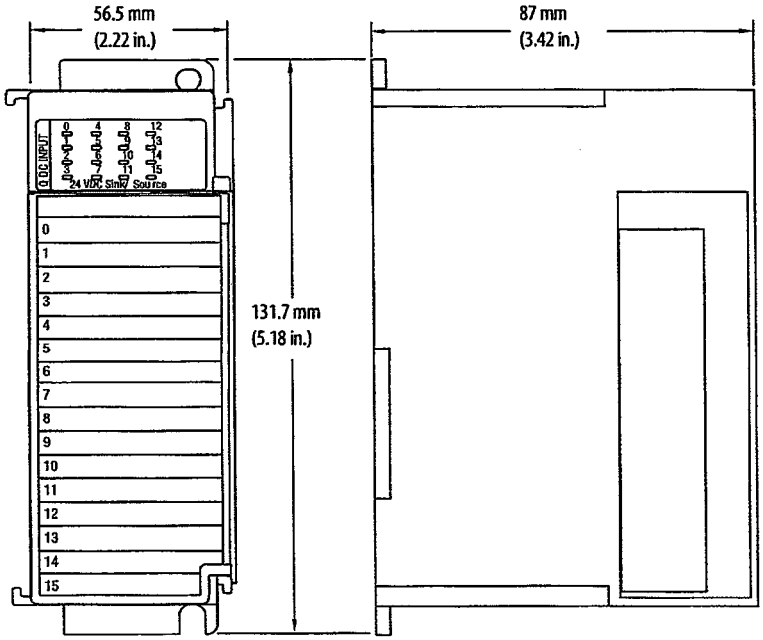
(1) When marked. See the Product Certification link at http://www.rockwellautomation.com/global/certification/overview.page for Declarations of Conformity, Certificates, and other certification details.

Compact I/O Mounting Dimensions

Single 1769 Slot Dimensions



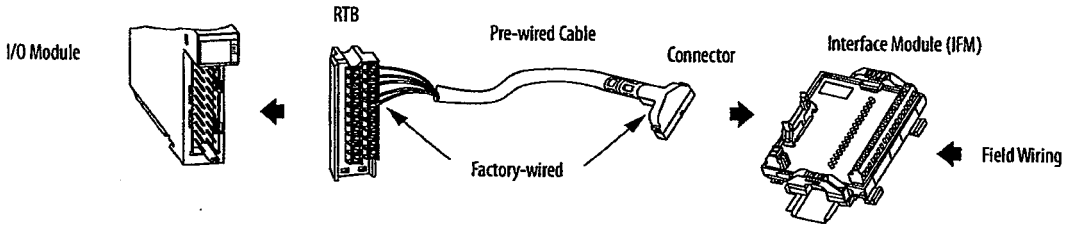
One-and-a-half 1769 Slot Dimensions



Wiring Systems

You can buy removable terminal blocks (RTBs) and connect the wires yourself or you can buy a wiring system of:

- Interface modules (IFMs) that provide the output terminal blocks for digital I/O modules. Use the pre-wired cables that match the I/O module to the IFM.
- Analog interface modules (AIFMs) that provide the output terminal blocks for analog I/O modules. Use the pre-wired cables that match the I/O module to the AIFM.
- I/O module-ready cables. One end of the cable assembly is an RTB that plugs into the front of the I/O module. The other end has individually color-coded conductors that connect to a standard terminal block.



Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
Compact I/O Modules Installation Instructions, publication 1769-IN088	Provides installation instructions for all 1769 Compact I/O modules.
CompactLogix System User Manual, publication 1769-UM007	Provides information about how to place, configure, and monitor 1769 Compact I/O modules in a CompactLogix system.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, http://www.rockwellautomation.com/global/certification/overview.page	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at http://www.rockwellautomation.com/literature/. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

Catalog Number Explanation

150-S	135	N	B	D
a	b	c	d	e

a	
Bulletin Number	
Code	Description
150-S	SMC-50 Motor Controller

b			
Controller Type and Rating			
SMC-50 Controller with Internal Bypass		Solid-state SMC-50 Controller	
Code	Description	Code	Description
108	108 A with Internal Bypass	B1	90 A
135	135 A with Internal Bypass	B2	110 A
201	201 A with Internal Bypass	B3	140 A
251	251 A with Internal Bypass	B4	180 A
317	317 A with Internal Bypass	C1	210 A
361	361 A with Internal Bypass	C2	260 A
480	480 A with Internal Bypass	C3	320 A
		D1	361 A
		D2	420 A
		D3	520 A

c	
Enclosure Type	
Code	Description
N	Open

d	
Line Voltage	
Code	Description
B	200...480V AC, 3-Phase, 50 and 60 Hz
U	200...690V AC, 3-Phase, 50 and 60 Hz

e	
Control Voltage	
Code	Description
D	100...240V AC (two 24V DC inputs and two relay outputs standard)
R	24V DC (two 24V DC inputs and two relay outputs standard)

Notes:

Rockwell Automation Support

Use the following resources to access support information.

Technical Support Center	Knowledgebase Articles, How-to Videos, FAQs, Chat, User Forums, and Product Notification Updates.	www.rockwellautomation.com/knowledgebase
Local Technical Support Phone Numbers	Locate the phone number for your country.	www.rockwellautomation.com/global/support/get-support-now.page
Direct Dial Codes	Find the Direct Dial Code for your product. Use the code to route your call directly to a technical support engineer.	www.rockwellautomation.com/global/support/direct-dial.page
Literature Library	Installation Instructions, Manuals, Brochures, and Technical Data.	www.rockwellautomation.com/literature
Product Compatibility and Download Center (PCDC)	Get help determining how products interact, check features and capabilities, and find associated firmware.	www.rockwellautomation.com/global/support/pcdc.page

Documentation Feedback

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete the How Are We Doing? form at http://literature.rockwellautomation.com/idc/groups/literature/documents/du/ra-du002_-en-e.pdf.

Rockwell Automation maintains current product environmental information on its website at http://www.rockwellautomation.com/rockwellautomation/about-us/sustainability-ethics/product-environmental-compliance.page.

Rockwell Otomasyon Ticaret A.Ş., Kar Plaza İş Merkezi E Blok Kat:6 34752 İçerenköy, İstanbul, Tel: +90 (216) 5698400

www.rockwellautomation.com

Power, Control and Information Solutions Headquarters
Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444
Europe/Middle East/Africa: Rockwell Automation NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640
Asia Pacific: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

Publication 1769-TD006G-EN-P - March 2020
Supersedes Publication 1769-TD006F-EN-P - September 2015

INSTALLATION AND STORAGE REQUIREMENTS FOR PUMP SKID UNIT

INSTALLATION:

1. The skid mounting surface can be a pad, but preferably a footing to support the entire perimeter of each of the skid unit(s). This footing should be designed in accordance with local building codes for the support of similar steel structures.

2. Typically the skid will be fabricated **WITHOUT** anchor bolt holes. Anchoring of the skid is done by placing anchor bolt plates over the bottom of the skid framing member and securing to the footing with expansion or epoxy anchor bolts. The skid is leveled, piping and electrical installation are complete before anchoring. For most installations, a total of eight (8) such anchors are recommended (local authorities may dictate otherwise) for each unit. This would include two (2) anchors down each long side (evenly spaced), with two (2) at each end (evenly spaced). For suggested anchor detail, see sketch attached.

3. After the skid is installed and leveled, but before anchoring, check the doors for fit and ease of movement. The entire package is assembled on a level surface at the factory and checked for proper operation before shipment. Occasionally, when the building is set, the doors do not line- up as they should. This can usually be corrected by shimming to level the skid on the foundation. Some experimenting may be required as each footing will vary slightly and the shim may need to be shifted until satisfactory door alignment is achieved. Once proper alignment is achieved the skid should be anchored down and the interior of the skid filled with concrete over a packed granular fill (gravel). The concrete should be 4"-6" thick and finished with some surface texture. For deckplated skids, the perimeter members of the skid should be grouted.

4. For skids with poured concrete floors, once the floor has cured the baseplate is to be grouted with a non-shrink grout.

5. The field electrician will need to connect the building heater. The field electrician is responsible for grounding the building per local codes.

6. All bolts need to be tightened after shipment. Bolts can become loose due to vibration from traveling and loading and unloading.

7. All valves are to be in the closed position prior to filling the system.

8. All drains in system that are to be field connected need to be routed appropriately by the installing contractor.

9. It is the installing contractor's responsibility to inspect the entire package before receiving the unit. Any damage must be noted in writing on the bill of lading. Pictures should be taken when possible. Failure to do so could result in a denial of a warranty claim.

10. All flexible coupled pumps shall be field aligned once the building has been anchored. Pumps are factory aligned, but vibrations in shipping and flexing of the station during loading and unloading may change the alignment. This shall be done by the installing contractor.

STORAGE:

1. Place on a dry, hard, level surface.
2. Protect from weather and airborne contamination (if not enclosed).
3. Protect from effects of temperature extremes and humidity, to prevent condensation.
4. Protect from physical damage.
5. Maintain corrosion protection on exposed bare metal surfaces.
6. Rotate pump shaft by hand at least once per week. Rotate two revolutions stopping at a point 90 degrees from the initial shaft position.

ASSEMBLY PROCEDURE

PATTERSON PUMP COMPANY POB 790 9201 AYERSVILLE ROAD TOCCOA, GEORGIA 30577	ORDER FIRST USED ON:			AP-77-4
	ISSUED BY: AP/DH	DATE: 09/15/08		

Standard Lubricated Torque Values (Ft-lbs.)				
Bolt Size	**Standard Bolts SAE Grade 0,1, 2 Low Carbon Steel No Head Marking**	**Medium Strength SAE Grade 5 Med Carbon Steel 3 Radial Lines**	**High Strength SAE Grade 8 Med Carbon Alloy 6 Radial Lines**	**Stainless Bolts 300 Series Letters & Numbers**
¼	60-72 in-lbs	96 – 108 in-lbs	144 – 156 in-lbs	66 – 75 in-lbs
5/16	120 – 132 in-lbs	192 – 204 in-lbs	300 – 336 in-lbs	120 – 132 in-lbs
3/8	132 – 144 in-lbs	300 -336 in-lbs	40-45	216 – 240 in-lbs
7/16	27 – 30	40-45	70-75	27 – 31
½	40 – 45	61-66	105-115	40 – 43
9/16	61 – 66	90-100	155-165	52 – 57
5/8	85 – 95	120-130	215-225	82 – 92
¾	140 – 150	210-220	350-370	115 –125
7/8	190 – 200	340-350	525-585	175 –195
1	280 – 300	510-520	625-685	240 – 260
1 1/8	425 – 475	720-730	1310-1410	340 – 390
1 ¼	600 – 660	900-1000	1855-1955	420 – 480
1 3/8	800 – 885	1225-1325	2520-2620	
1 ½	960 –1060	1620-1720	3075-3175	620 – 700
1 5/8	1350 –1450	2120-2220	4275-4375	
1 ¾	1780 –1880	2620-2720	5525-5625	
1 7/8	2200 – 2340	3220-3320	7450-7550	
2	2520 – 2720	3940-4040	8050-8150	

SKID UNLOADING GUIDE

LIFT ARM POSITIONING:

- The skid lifting arms consist of two pipes inserted through two larger Sch 40 pipes that are an integral part of the skid structure. The smaller pipes are approximately 4 FT longer than the skid width and when properly positioned will expand beyond the skid on each side. It is recommended that the lifter cables not be located farther than 6" form the skid structure.
- On larger units, the lifting arms are welded in place and are approximately 8 inches wider than the skid width, 4 inches on each side.
- On small units, four lifting lugs are used instead of lifting arms.

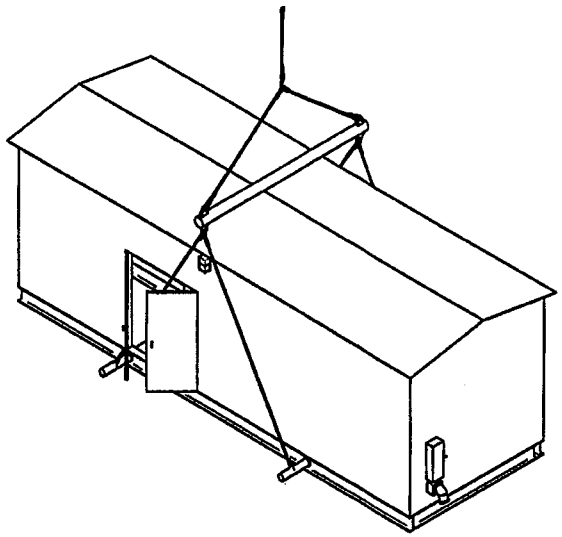
RIGGING:

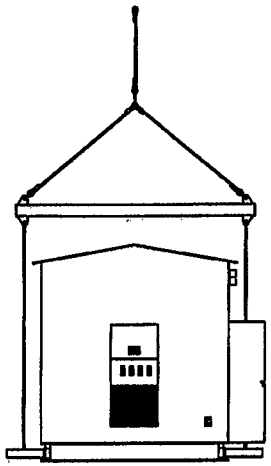
- The lower cables attach between the four lift points on the skid and the spreader bar (see sketch). The cables (supplied by the crane operator) should be long enough so that the angle between the cables does not exceed the recommendation of the cable supplier. We have found that an included angle of 40-45 degrees between cables allows for good stability. The longer the cables, the more stable the load.
- The spreader bar (supplied by the crane operator), should be about two feet wider than the skid base. The upper cables should be somewhat longer than the lower cables (approximately 20%). Again, the cable manufacturer's recommendation should be followed.
- Proper rigging of the skid for lifting is the responsibility of the customer. The above rigging suggestions are meant only as a guide and are not to be construed as complete instructions, consequently Patterson Pump Company shall not be responsible for the use or misuse of these suggestions. The customer is encouraged to retain the services of a qualified contractor experienced in the rigging of similar structures.

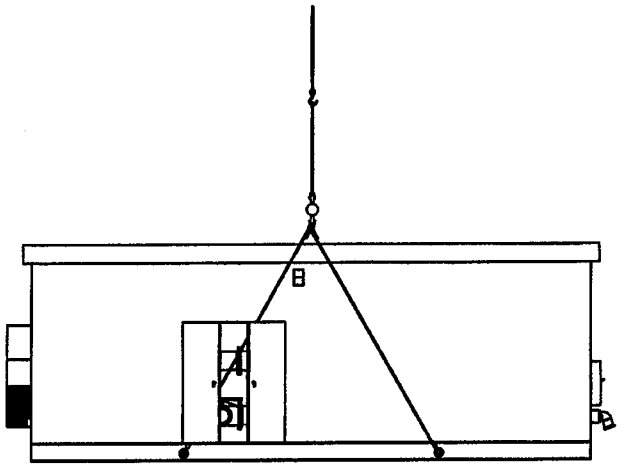
THIRD ANGLE PROJECTION

ZONE	REV	ECR	DATE	BY

EXAMPLE OF RIGGING







DIMENSIONS IN ( ) ARE FOR REFERENCE ONLY ALL PRIMARY DIMENSIONS ARE IN INCHES AND SECONDARY DIMENSIONS, SHOWN IN [ ], ARE IN MILLIMETERS

REF ANSI Y 14.5 1994		DIAMETER	⌀	ANGULARITY	∠
CHARACTERISTIC	SYMBOL	DATUM FEATURE	-A-	POSITION	⌖
PROFILE OF A LINE	⌒	DEPTH	▽	CONCENTRICITY	◎
PROFILE OF SURFACE	⌓	ROUNDNESS	○	RUNOUT (CIRCULAR)	↗
AT MAX. MATERIAL CONDITION	Ⓜ	FLATNESS	▱	COUNTERSINK	⌵
AT LEAST MATERIAL CONDITION	Ⓛ	PARALLELISM	//	STRAIGHTNESS	—
REGARDLESS OF FEATURE SIZE	Ⓢ	PERPENDICULARITY (SQUARENESS)	⊥		
RUNOUT (TOTAL)	↗↗	COUNTERBORE (BACK SPOT)	⌴		

MACHINIST NOTE:

BREAK ALL SHARP CORNERS TO A .02 X 45° CHAMFER

DWG REF #	ORDER NUMBER	JOB NUMBER
	C0	

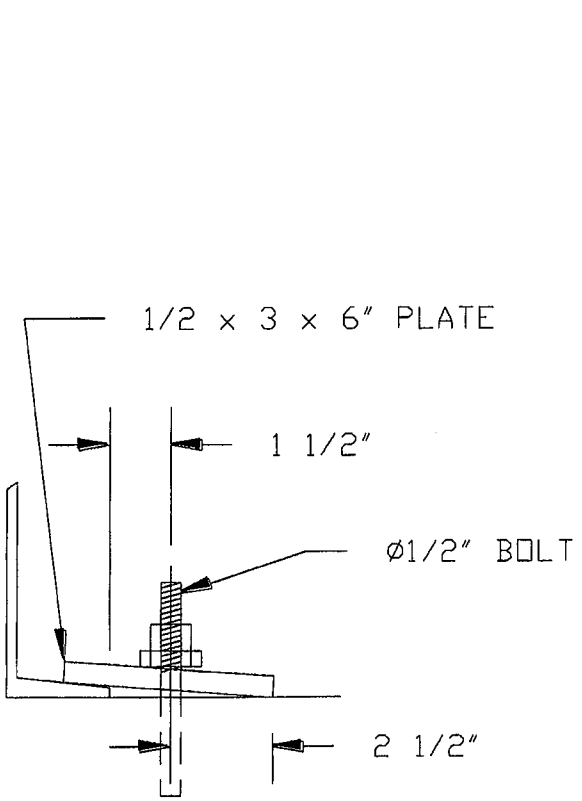
PRIMARY TOLERANCES (EXCEPT AS NOTED)	
2 PLC DEC.	±.03"
3 PLC DEC.	±.005"
ANGULAR	±1°
TORCH CUT	±.06"

FABRICATION	
UP TO 6"	±.06"
6" TO 24"	±.12"
24" TO 60"	±.19"
60" TO 120"	±.25"
OVER 120"	±.50"

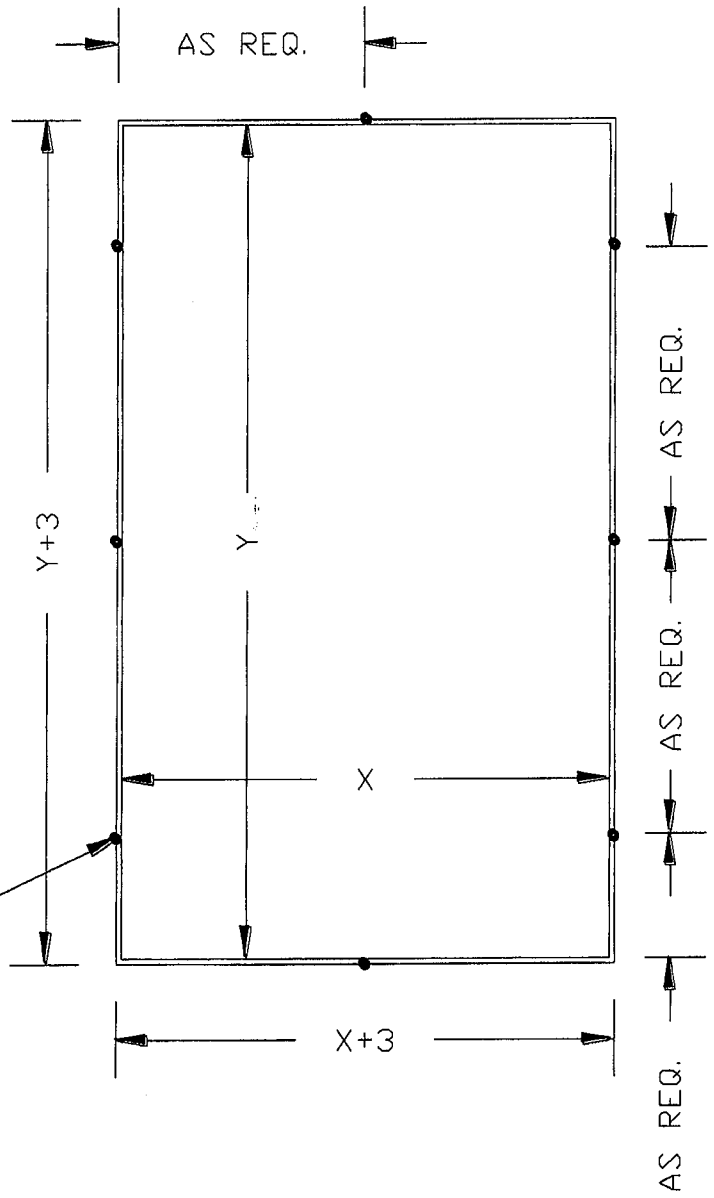
PATTERSON PUMP COMPANY
A GORMAN-RUPP COMPANY

TITLE	DRAWING NUMBER	REV.
LIFTING DETAIL	B80-143702	0
	PATTERN NUMBER	
SHEET 1 OF 1 / SCALE	PART NUMBER	

DRAWN	CHECKED	APPROVED	DATE
MDAVIS	CB	CB	10/17/2016



ANCHOR BOLTS
SPACED AS REQUIRED



PIPE SUPPORTS NOT SHOWN FOR CLARITY.

THIS DRAWING IS CERTIFIED

☒ FOR APPROVAL
NO PRODUCTION WILL START UNTIL APROVED IN WRITING

☐ FOR CONSTRUCTION
PRODUCTION HAS STARTED ANY CHANGES MAY AFFECT PRICE AND DELIVERY

OUR ORDER NO.: NONE

CUST. ORDER NO.: _____

BY: _____ DATE: 00/00/00

KEY LEGEND

KEY	DESCRIPTION

CERTIFIED FOR APPROVAL ONLY! X

CERTIFIED FOR CONSTRUCTION___

REV.	DATE	DESCRIPTION
-	-	-

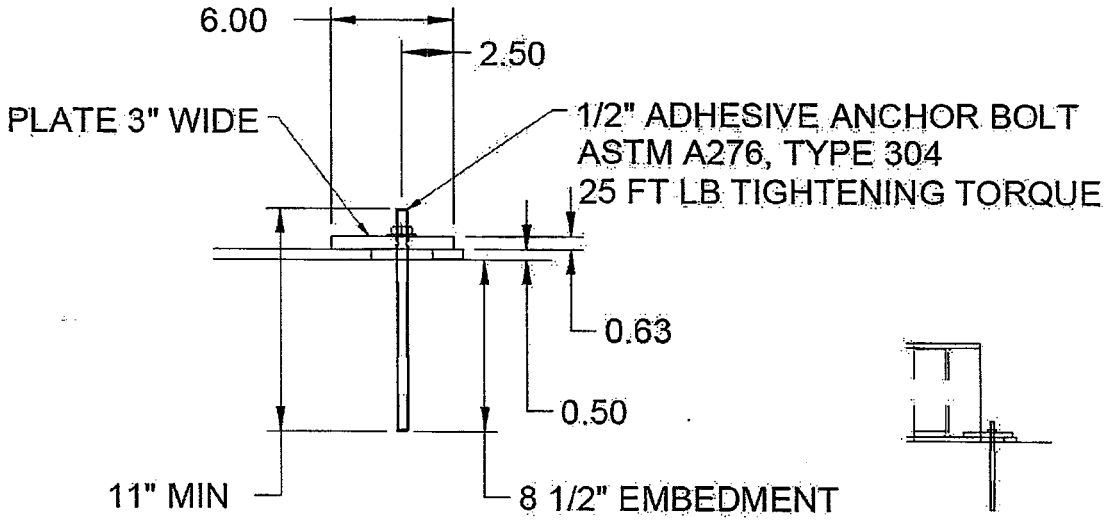
FLO-PAK Georgia Atlanta

JOB TITLE: BOOSTER ANCHOR BOLTS

PROD.CODE:	
CHECKED:	---
DRAWN BY:	J.P.
DATE:	00/00/00
SCALE:	NONE
CAD FILE:	DWG\BAB
SHEET:	REV: -

A Gorman-Rupp Company

Patterson's Standard Municipal Anchor Plate Design



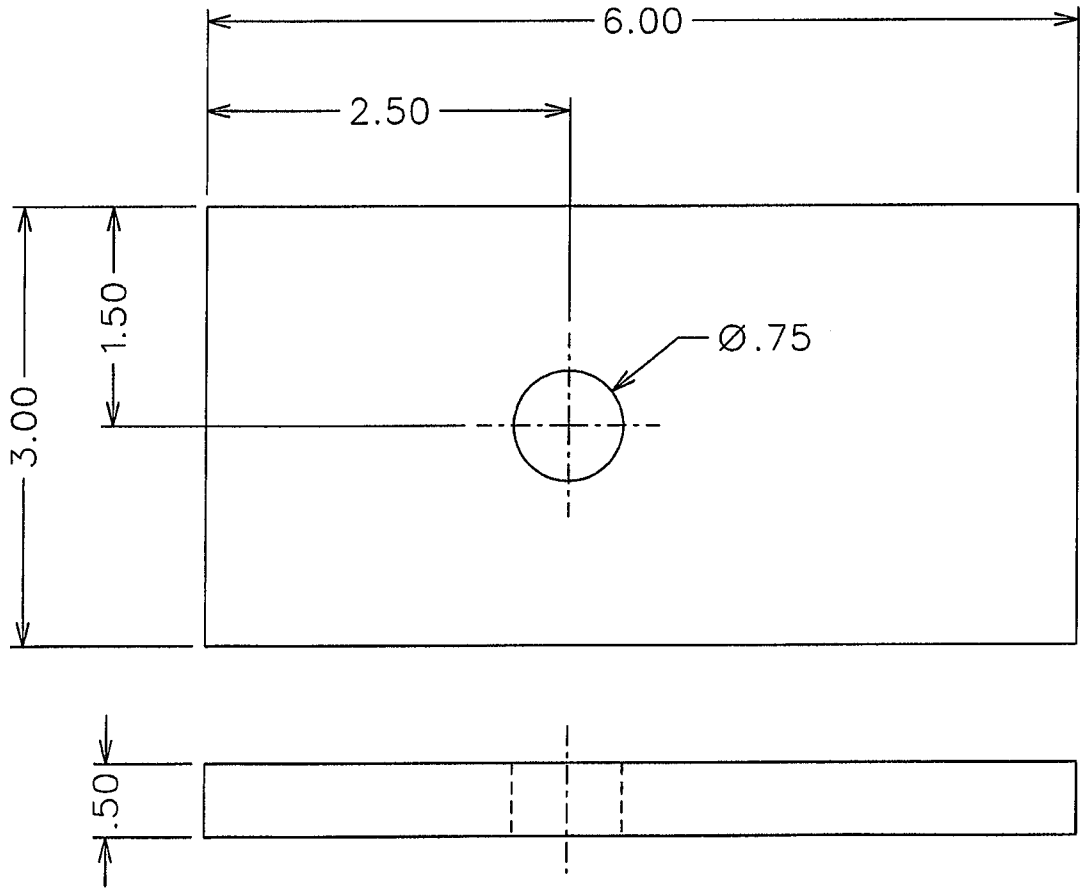
- The typical recommended embedment depth is a minimum of 8.5".
- The projection of the bolt above the surface should be a minimum of 1.5".
- The hole in anchor plate is drilled as depicted in the drawing 2.5" from the edge of the .5" x 3" x 6" plate. The 3.5" side will face the skid.
- The anchor bolt needs to be approximately 1.5" from the edge of the skid. (Note this can be extended up to 2" if necessary but no further than 2".)
- Additionally it is recommended but not required to use a .5" x 1" x 3" leveling shim under the opposite side of the anchor plate (parallel to the skid). This will ensure that the maximum clamping force is applied to the anchor plate/beam, while also reducing the amount of moment being applied to the anchor bolt.

PATTERSON PUMP COMPANY / A Gorman-Rupp Co.
P.O. Box 790 / Toccoa, Georgia 30577 / (706) 886-2101 / FAX (706) 886-0023
www.pattersonpumps.com

TOLERANCES (EXCEPT AS NOTED)	REVISIONS				PATTERSON PUMP COMPANY TOCCOA, GEORGIA	CHKD. CS	SCALE 3/4	DRWG. NO. A80-84838	REV.
	NO.	ECR	DATE	BY					
DECIMAL ± .03					HOLD-DOWN CLIP	APPRVD. CS	DATE 10-14-02		
						MAT. SEE B/M	DRAWN COOK	PATT. NO.	
ANGULAR ±						PART NO. 74079992	REF.	JOB NO.	

DIMENSIONING AND TOLERANCING IN ACCORDANCE WITH ASME Y14.5M 1994 STANDARDS

ALL DIMENSIONS IN INCHES UNLESS STATED OTHERWISE



EMMETT PUBLIC WORKS DEPARTMENT
601 East 3rd Street - Emmett, Idaho 83617
Clint Seamons, Public Works Director

Thursday, August 06, 2020

Mayor, City Council:

I am requesting from City Council a **MOTION to accept return of the pool property from Gem County Recreation District as presented in their Quit Claim Deed.**

Attached is the Quit Claim Deed for your review.

Thank you,

Clint Seamons
Public Works Director

601 E 3rd STREET, EMMETT ID, 83617
EMAIL: CSEAMONS@CITYOFEMMETT.ORG

RECORDING REQUESTED BY AND
WHEN RECORDED RETURN TO:
CITY OF EMMETT
501 E. MAIN ST.
EMMETT, IDAHO, 83617

(Space Above For Recorder's Use)

QUITCLAIM DEED

Gem County Recreation District, Emmett, County of Gem, State of Idaho, 83617, ("Grantor"), for a good and valuable consideration, the receipt of which is hereby acknowledged, does hereby remise, release and forever quitclaim unto the City of Emmett, an Idaho municipal corporation, whose address is 501 E. Main Street, Emmett, Idaho, 83617 ("Grantee"), and its heirs and assigns forever, all right, title and interest which Grantor now has or may hereafter acquire in the following described real property situated in Gem County, State of Idaho:

See Exhibit A attached and incorporated by this reference.

This conveyance is made with the understanding the property described in Exhibit A is no longer being used as a public swimming pool. Thus being outlined in Quitclaim Deed, Instrument # 176238, executed June 8, 1993, stating if the property is not used, maintained, and operated as a public swimming pool, then all the right, title, and interest in and to the described property and to the improvements on such property, shall revert to and revest in the City of Emmett or it's successors, as fully and completely as if instrument #176238 had not been executed, and the City of Emmett may enter and take possession of the described premises.

IN WITNESS WHEREOF, the Grantor has executed this instrument on this_____ day of _____, 2020.

GEM COUNTY RECREATION DISTRICT:

_____
Wayne Rexford, President

ATTEST:

_____
Brook White
Secretary / Treasurer

STATE OF IDAHO)
) ss.
County of Gem)

On this _____ day of _____, 2020, before me a notary public, personally appeared, Wayne Rexford, known or identified to me, to be the President of the Gem County Recreation District, Emmett, Idaho and the person that executed the said instrument, and acknowledged to me that he executed the same as President of the Gem County Recreation District, Emmett, Idaho.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year in this certificate first above written.

_____
NOTARY PUBLIC FOR IDAHO
Residing at _____
My Commission Expires _____

Exhibit A

Legal Description, Pool Site

A tract of land situated in a portion of the Northeast 1/4 of the Northeast 1/4 of Section 7, Township 6 North, Range 1 West. Boise Meridian, Gem County, Idaho, more particularly described as follows:

Commencing at the Section corner common to Section 5, 6,7, and 8, Township 6 North, Range 1 West, marked by a found brass cap monument:

Thence South 15°04'13" West, a distance of 542.56 feet to a set 1/2" iron pin L.S. 4108 and the REAL POINT OF BEGINNING:

Thence South 00°04'13" West, a distance of 160.00 feet to a set 1/2" iron pin L.S. 4108:

Thence North 89°55'47" West, a distance of 180.0 feet to a set 1/2" iron pin L.S. 4108:

Thence North 00°04'13" East, a distance of 160.00 feet to a set 1/2" iron pin L.S. 4108:

Thence South 89°55'47" East, a distance of 180.00 feet to the point of beginning.