

**SUBMITTAL TO THE BOARD OF SUPERVISORS  
COUNTY OF RIVERSIDE, STATE OF CALIFORNIA**



**ITEM: 16.3**  
(ID # 30178)

**MEETING DATE:**  
Tuesday, April 14, 2026

**FROM :** Regional Parks and Open Space District

**SUBJECT:** RIVERSIDE COUNTY REGIONAL PARK AND OPEN-SPACE DISTRICT: Adoption of Resolution No. 2026-002, Declaration of Exempt Surplus Land and Notice of Intention to Convey Fee Simple Interest in Real Property located in the City of La Quinta, identified as Assessor's Parcel Number 762-010-007 from the Riverside County Regional Park and Open-Space District to the County of Riverside by Quitclaim Deed, District 4, [\\$0] (Clerk of the Board to Give Notice Pursuant to Government Code Section 6063, Requires 4/5 Vote) (Set for Public Hearing on or after May 5, 2026 @ 9:30 a.m. or soon thereafter)

**RECOMMENDED MOTION:** That the Board of Directors:

1. Adopt Resolution No. 2026-002, Declaration of Exempt Surplus Land and Notice of Intention to Convey Fee Simple Interest in Real Property located in the City of La Quinta, identified as Assessor's Parcel Number 762-010-007 from the Riverside County Regional Park and Open-Space District to the County of Riverside by Quitclaim Deed; and
2. Authorize and direct the Clerk of the Board to give notice pursuant to Section 6063 of the Government Code.

**ACTION:4/5 Vote Required**


  
Kyla R. Brown, General Manager 3/30/2026

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**MINUTES OF THE BOARD OF DIRECTORS**

On motion of Director Perez, seconded by Director Washington and duly carried by unanimous vote, IT WAS ORDERED that the above matter is approved as recommended and is set for public hearing on or after Tuesday, May 5, 2026, at 9:30 a.m. or as soon as possible thereafter.

Ayes: Medina, Spiegel, Washington, Perez, and Gutierrez  
Nays: None  
Absent: None  
Date: April 14, 2026  
xc: Parks, COB/AG

Kimberly A. Rector  
Clerk of the Board  
By:   
Deputy

**SUBMITTAL TO THE BOARD OF SUPERVISORS COUNTY OF RIVERSIDE,  
STATE OF CALIFORNIA**

<b>FINANCIAL DATA</b>	<b>Current Fiscal Year:</b>	<b>Next Fiscal Year:</b>	<b>Total Cost:</b>	<b>Ongoing Cost</b>
<b>COST</b>	\$0	\$0	\$0	\$0
<b>NET COUNTY COST</b>	\$0	\$0	\$0	\$0
<b>SOURCE OF FUNDS: N/A</b>			<b>Budget Adjustment: No</b>	
			<b>For Fiscal Year: 25/26</b>	

**C.E.O. RECOMMENDATION:** Approve

**BACKGROUND:**

**Summary**

The District owns 20.78 acres, identified by Assessor's Parcel Number 762-010-007 (Property), as more particularly described in Resolution No. 2026-002, adjacent to the Lake Cahuilla Recreational Area in the City of La Quinta and is surrounded by parcels owned by Coachella Valley Water District and US Bureau of Reclamation. The Riverside County Sheriff's Office (RSO) currently leases the Property to operate a shooting range, which its improvements straddle on a portion of District land. RSO has operated the shooting range at this location since the 1960s.

Under California law, park districts, including the Riverside County Regional Park and Open-Space District (District) have the authority to dispose of real property, including transferring it to other entities, provided certain conditions are met in accordance with Public Resources Code Section 5540. The District may convey real property that has been "actually dedicated and used for park or open-space purposes" through legislative authorization via a concurrent resolution after a two-thirds vote of the district's board of directors. This provision ensures that property formally dedicated for park purposes cannot be transferred without significant procedural safeguards.

The California Supreme Court clarified that real property acquired by regional park districts is not automatically subject to restrictions on conveyance unless it has been formally dedicated by an affirmative act, such as a resolution by the board of directors. *Ste. Marie v. Riverside County Regional Park & Open-Space Dist.*, 46 Cal.4th 282 (2009).

In this case, the Property has never been formally dedicated. Accordingly, the statutory restrictions applicable to dedicated parkland do not apply. The District has determined the Property is no longer necessary for its purposes and intends to transfer its fee simple interest in the Property as more particularly described in Resolution No. 2026-002 by Quitclaim Deed to the County of Riverside.

The District recommends the Property be declared exempt surplus land because it will be conveyed to another local agency (County) for the transferee agency's continued use and is no longer needed to be owned in fee by the District per Government Code Section 54221(f)(1)(D).

Resolution No. 2026-002 has been reviewed and approved by County Counsel as to legal form.

**SUBMITTAL TO THE BOARD OF SUPERVISORS COUNTY OF RIVERSIDE,  
STATE OF CALIFORNIA**

**Impact on Residents and Businesses**

The proposed transfer will streamline operations by eliminating the need for lease administration between RSO and the District and will enable the County to continue operating the property as a shooting range without interruption.

**Additional Fiscal Information**

Not applicable.

**ATTACHMENTS:**

- Resolution No. 2026-002

  
Douglas Ordóñez Jr. 4/6/2026

  
Aaron Gettis, Chief Deputy County Counsel 4/2/2026

# Quotation



Riverside CA #327  
 2656 Market St  
 Riverside, CA 92501-2126  
 W: (951)684-1080

**Bill To:**

Riverside County Regional Park Park & Open-Space D (#209383)  
 4600 Crestmore Rd  
 Riverside, CA 92509-6858  
 W: (951)781-0143

**Ship To:**

Riverside County Regional Park Park & Open-Space D (#209383)  
 4600 Crestmore Rd  
 Riverside, CA 92509-6858  
 W: (951)781-0143

Created	Quote#	Due Date	Expected Award Date	Expiration Date
01/07/2026	8164030	01/07/2026	01/07/2026	02/07/2026

Printed	Job Name	Job Description	Job Start Date
01/08/2026 17:22:13	Rancho Jurupa Regional Park	Lake Pump All in One - Option 3	01/07/2026

Line #	Item #	Item Desc	Qty	UOM	Unit Price	Extended Price
1	C	This quote replaces 8059341			0.000	
2	C	***VALIDITY: PUMP PRICES ARE GOOD FOR 30 DAYS***			0.000	
3	NSI-26616	VFD PANEL ASSEMBLY	1		56,832.353	56,832.35
4	BILLEDFREIGHT	Freight	1	EA	1,060.000	1,060.00
5	NSI-CLARITY5YR	Clarity WMS 5 Year Contract	1		5,500.000	5,500.00
6	WVL100	Hunter Single-Station Wireless Valve Link Antenna Included	2	EA	148.313	296.63
7	SALES TAX @ 8.75%		1		5,572.790	5,572.79
8	ST	Subtotal Line 1			0.000	69,261.77
9	C					
10	GTINSTALL	GT Installation Labor <b>Item Note:</b> <i>Labor includes pouring a new concrete pad to install new control panel. Installation includes replacing wiring from main vertical turbine motor, and 2 motors located on the current Rainbird skid to control panel, includes extending Rainbird transducer wires to new control panel, installing new transducer on vertical turbine motor, start up and verifying functionality. SiteOne is not responsible for running power from existing control boxes to the new control panel.</i>	1	EA	5,000.000	5,000.00
11	GTMISCPARTS	GT Miscellaneous Parts	1	EA	500.000	500.00
12	C	NOTE: <b>Item Note:</b> <i>County must demo, remove and prep the existing pump control panel and provide equipment to set the station panel on new pad. The County also must provide power to the new concrete pad location prior to setting the new control panel.</i>			0.000	

**Total Price: \$ 74,761.77**

SiteOne Landscape Supply is not responsible for the accuracy of the items contained in this quotation. Please review carefully. Please add appropriate sales tax. Prices on this quote are good for 30 days after the entered bid date. Local tax may differ based on locations and local codes.

# PPS

Precision Pumping Systems



**DESIGN | BUILD | TEST | INTEGRATE**

**GoPPS.com • 208.323.5300**

QUOTE#: \_\_\_\_\_

PPS SALES CONTACT: \_\_\_\_\_

DATE: \_\_\_\_\_

## CONTROL PANEL SUMMARY

<u>VOLTAGE/PHASE</u>	/
<u>CONTROLS</u>	
<u>ENCLOSURE</u> CONSTRUCTION NEMA RATING ENVIROMENT	
<u>SHIPPED LOOSE</u> <u>EQUIPMENT</u>	

**SPECIAL NOTES:**

### MATERIAL SUBSTITUTION DISCLAIMER:

**YES**

I authorize PPS to make material changes to equal or better quality components, as market availability allows, in order to minimize my project lead time.

**NO**

I understand that material lead-times are currently unreliable and accept that. I only want the material that was approved per submittal.

APPROVED BY: \_\_\_\_\_

DATE: \_\_\_\_\_

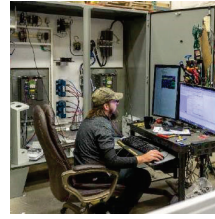
## PRECISION PUMPING SYSTEMS' COMPANY & FACILITY FEATURES



State of the Art  
Manufacturing  
Facility



Extensive Pump  
Station Testing  
Facilities



VFD/ Automation  
Testing Facility



Large Inventory of  
replacement  
equipment & parts

### Family Owned & Operated Since 1972



For over 100 years, the Purdy Family has been involved in agricultural irrigation and irrigation/municipal water system sales.

The core staff of PPS has been here from the very beginning. We have decades of accumulated knowledge in our field.

We take great pride in the products, support, and services we offer.

### Leaders in Variable Speed Pumping Technology



PPS has been integrating VFD's with Pumps for 40 years.

We use the latest technology to create simpler, safer, and more efficient systems. PPS was one of the first pump station manufacturers to effectively implement programmable logic controllers to achieve this goal.

Easy to understand, Easy to operate touch-screens on every system.

### Unparalleled Service & Support



Personal Service Available 24/7

Free Remote Technical Support for the Life of the System

3 Year Standard Warranty

Professional Start-up & Training Services

### Collaborative Design



PPS uses the latest software to design perfectly accurate, top quality pump station designs to ensure premium performance and quality. Precise dimensions and site layout for guaranteed ease of installation. PPS will work directly with site contractors before delivery to ensure an easy and successful installation.



## Leading Manufacturer of Pre-Packaged Pump Systems

Precision Pumping Systems • Boise, ID 208.323.5300 • Columbia, SC 839.895.5350 • GoPPS.com

## Quality Management System – ISO 9001:2015

PPS Boise Facility Complies with the requirements of ISO 9001:2015 for the manufacturing of pumping systems, pump control panels, and remote monitoring control systems.

**Certificate No:** CERT-0138890

**Issue Date:** March 28, 2024

**File No:** 1694007

**Certificate Expiry Date:** March 27, 2027

## Safety Management System – (UL 508A / UL QCZJ)

### UL 508A - Standard for Industrial Control Panels:

This certifies that the control panel complies with nationally recognized safety standards.

PPS manufactures Control Panels in accordance with the National Electrical Code, NFPA 70.

**File #:** E210861

### UL QCZJ - Packaged Pumping Systems:

This certifies that the complete pumping system, including the control panel, complies with nationally recognized safety standards.

PPS manufactures Packaged Pumping Systems in accordance with Article 680 or 682 of ANSI/NFPA 70, "National Electrical Code" (NEC).

**File #:** E327721

In addition to these safety and quality certifications, each pump station undergoes a complete factory dynamic test to ANSI/HI 14.6 and ANSI/HI 9.6.4 standards and specifications.



**Leading Manufacturer of Pre-Packaged Pump Systems**

Precision Pumping Systems • Boise, ID 208.323.5300 • Columbia, SC 839.895.5350 • GoPPS.com

**NITW.E210861****Industrial Control Panels**[Page Bottom](#)**Industrial Control Panels**[See General Information for Industrial Control Panels](#)**PRECISION PUMPING SYSTEMS**

E210861

6515 BUSINESS WAY  
BOISE, ID 83716 USA

Industrial control panels.

[Last Updated](#) on 2009-05-01[Questions?](#)[Notice of Disclaimer](#)[Page Top](#)

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An independent organization working for a safer world with integrity, precision and knowledge.



# CERTIFICATE OF COMPLIANCE

**Certificate number** UL-US-L327721-11-92409002-2  
**Report reference** E327721-20090429  
**Date** 2024-12-06

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.

<b>Model</b>	<b>Product Description</b>
CB Series*	Packaged pumping systems
S-Submersible Series*	Packaged pumping systems
T-Turbine Series*	Packaged pumping systems
V Series*	Packaged pumping systems
VMS Series*	Packaged pumping systems



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# CERTIFICATE

Section A2  
ISO 9001:2015  
Certification

Certificate Number: 112749.00

The Quality Management System and implementation of:

## Purdy Enterprises Inc, dba Precision Pumping Systems

With Central Functions At:  
6515 South Business Way  
Boise, ID 83716  
United States

meets the requirements of the standard:

## ISO 9001:2015

### Scope:

Design and manufacture of pumping systems, pump control panels, and remote monitoring and control systems.

### Site Activities:

**6515 South Business Way, Boise, ID 83716** – Design and manufacture of pumping systems, pump control panels, and remote monitoring and control systems.

**6941 South Supply Way, Boise, ID 83716** – Panel Assembly.

### Certification Structure: Campus

Certificate Expires: March 27, 2027  
Certificate Reissued: December 27, 2024  
Certificate Issued: March 28, 2024  
Certified Since: March 28, 2018



Dr. Cem O. Onus  
Managing Director

DEKRA Certification, Inc.  
1945 The Exchange SE #300  
Atlanta, GA 30339 USA  
(215) 997-4519  
<https://www.dekra.us/en/audits/>





## Precision Pumping Systems Standard Warranty

The equipment furnished as part of this agreement is subject to the original manufacturer's warranty only. In addition, Precision Pumping Systems (PPS) provides the following LIMITED WARRANTY.

### Telephone Technical Support

Free-of-charge for the life of your product. After hours fees may apply.

### Limited 1-Year Warranty

PPS warrants to the original buyer that its products and systems will be free from defects in material and workmanship for a period of twelve (12) months from the date of placing the Equipment in operation or fifteen (15) months from the date of completion of manufacture of the Equipment, whichever shall occur first.

When notified by the Owner about a defect which conforms to this Warranty, PPS shall, at its sole discretion, correct the defect by performing a suitable repair to the Equipment or by providing a replacement part. This warranty does not apply to equipment that has been damaged, misapplied or modified in any way.

### Terms and Conditions

1. Warranty claims must be submitted directly to Precision Pumping System within the valid warranty period. No claims for warranty will be paid without prior approval by PPS.
2. The determination regarding defective status of components or products is at the sole discretion of PPS.
3. If a component or product is determined to be defective by Precision Pumping System, then PPS shall, at its sole discretion, correct the defect by performing a suitable repair to the equipment or by providing a replacement part.
4. Proper start-up and operational procedures must be followed and documented, and the required maintenance must be performed and documented by authorized PPS personnel or authorized service providers (ASP). Failure to follow and document the required procedures and maintenance will void this warranty.
5. Within the first year, PPS will cover labor and materials costs. In any subsequent years of the warranty period (if an extended warranty is purchased) only materials costs are covered by this warranty – no labor costs will be paid.

Precision Pumping Systems - 6515 S. Business Way. Boise, ID 83716

Phone: 208-323-5300

[www.GoPPS.us](http://www.GoPPS.us)



Revised 6.01.25

## Disclaimers

1. The “Owner” is defined as the person or entity who has control of the Equipment.
2. PPS shall not be liable for repairs, replacements or adjustments to the Equipment or costs of labor performed by the Owner without prior written consent of PPS.
3. All PPS warranty provisions require the Owner to operate and maintain the Equipment according to good industry practices, manufacturer’s recommended maintenance, and to comply with all recommendations by PPS regarding operation and maintenance. The Owner must maintain documentation to support these provisions.
4. All damaged part(s) must be returned within 30 days of receiving the replacement part(s) or within the time frame set by any Return of Material documents, unless PPS approves otherwise in writing. Failure to return part(s) may result in claim denial.
5. PPS systems are equipped with safety features which protect key components from damage. Many of these safety features are overridden when operating the system in “Hand”. *Operation of the system in “Hand” voids this warranty unless directly authorized by a PPS technician.*
6. There is no warranty coverage for mechanical pump seals or packing glands unless the failure occurs during the initial start-up of the system.
7. Any modifications to the pumping system without written approval by PPS shall void this warranty. Such modifications include, but are not limited to, changes to PLC/HMI programming, changes to the VFD programming, removing or disabling sensors, or adding or removing valves or piping.
8. PPS makes no performance warranty unless specifically stated in its proposal.
9. The effects of corrosion, erosion, and normal wear and tear are specifically excluded from the PPS warranty.
10. PPS provides no warranty for used or existing customer owned equipment of any character expressed or implied.
11. PPS provides no warranty for any equipment provided by others that ties into PPS provided product. All such equipment is subject to the original manufacturer’s warranty. This includes, but is not limited to, pumps, motors & control systems. PPS shall not be liable for repairs, replacements or adjustments to Equipment or costs of labor should customer supplied equipment cause failure or damage to PPS Equipment.
12. Blown fuses regardless of cause are excluded. Damages or problems created by or caused by lightning or power surges, low voltage, dirty power, or other incoming power related problems are excluded from these warranties.
13. Damages created by or resulting from chemically treated, corrosive, excessively dirty water, mud, silt, sand, grass, weeds, or any other organic or inorganic materials, clogged pump intake impellers or suction screens, and/or build-up of sediment in the sump are excluded.



- 14. Natural disasters, misuse, abuse, or misapplication, or other causes beyond PPS' control, and acts of God are excluded from these warranties.
- 15. PPS will not accept any responsibility for the costs associated with systems installed in difficult to access areas including, but not limited to, those requiring cranes in excess of 5 tons, divers, helicopters, excavators, dredges, etc. Determination of difficult to access locations is at the sole discretion of PPS.
- 16. PPS MAKES NO OTHER WARRANTY OR REPRESENTATION OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES, INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE SPECIFICALLY EXCLUDED.
- 17. PPS will assume no liability for any incidental or consequential damages with respect to this contract or the Equipment and services furnished hereunder, in connection with the performance or breach thereof, or from the manufacture, sale, delivery, installation, repair or technical direction covered by or furnished under this contract. This is a commercial transaction.
- 18. It is also agreed that the owner's or purchaser's sole remedy, whether for breach of contract, warranty or in tort, shall be limited to the return of any goods and repayment of the contract price or the costs of repair and replacement of defective goods, at the option of PPS. No claim by the buyer of any kind shall be greater in amount than the net purchase price of the equipment.

**Choice of Law and Arbitration**

Any claim or controversy arising under or relating to this warranty shall be submitted for arbitration and shall be governed by the laws of the state of Idaho.

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Precision Pumping Systems - 6515 S. Business Way. Boise, ID 83716  
 Phone: 208-323-5300  
[www.GoPPS.us](http://www.GoPPS.us)



Give your Internet device the same control as your pump station PLC touch screen

Your system is equipped with a Wireless Modem that enables you to view and access your PLC's Touchscreen via Clarity Remote Monitoring System (RMS).



## Remote Monitoring and Controls

Clarity RMS allows you to monitor, adjust, and control your system from any web enabled device.

Fault Notifications will be sent to you immediately via SMS or Email. This will allow you to troubleshoot or diagnose your station off site and potentially save you the costly on-site visit.



Save time and money by reducing on-site visits.



Monitor, Adjust, and Control your station from any web enabled device.



Over 100 fault alarms that will notify you via SMS or Email.



Lower the risk of station downtime by making your system adjustments remotely.



PPS is available 24/7 for emergency diagnostics and trouble shooting.

## NO THIRD PARTY SOFTWARE REQUIRED!

### Connection Type:

- RMS
- Clarity-Lite
- Clarity-WMS

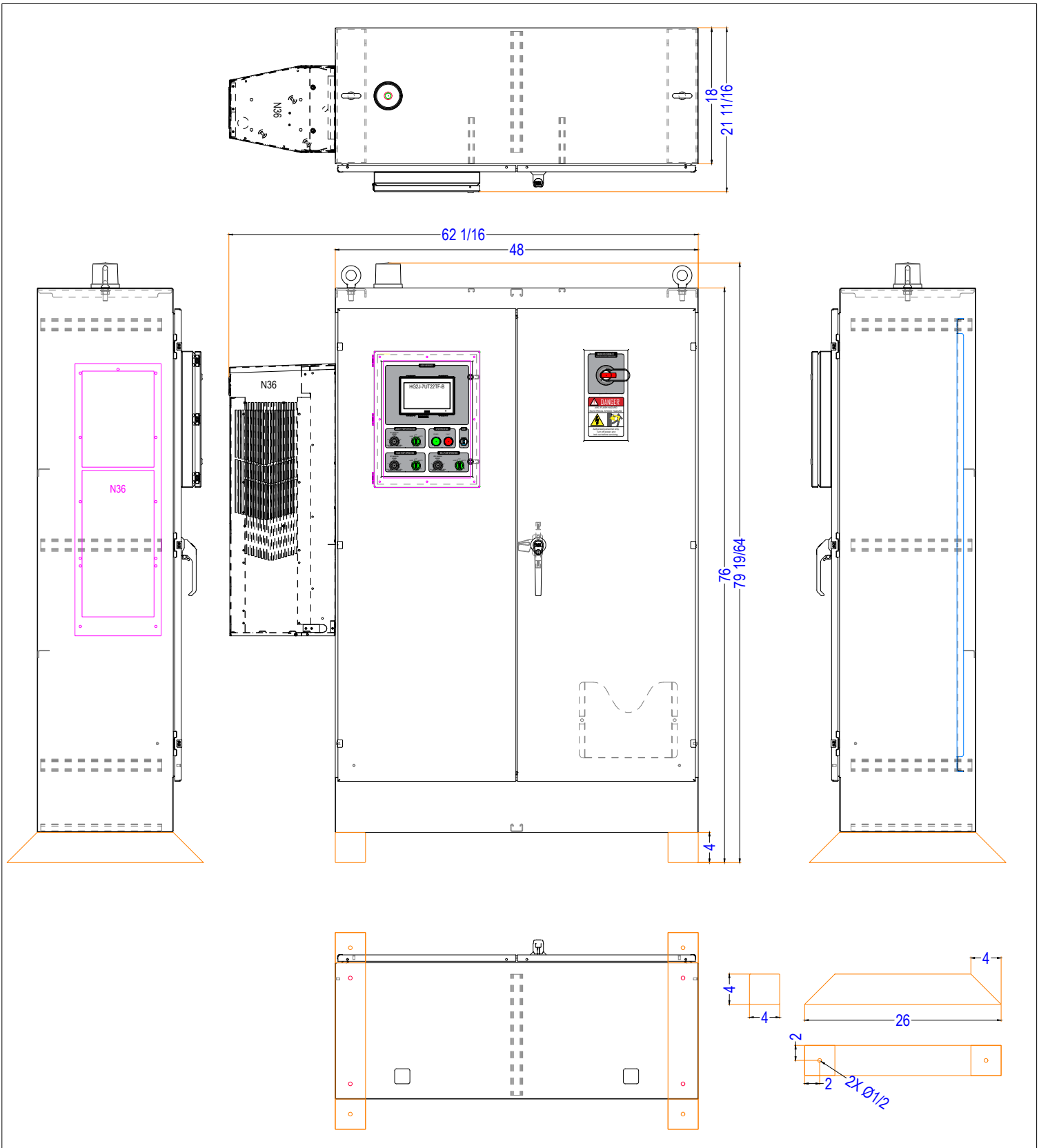
### Length of Plan:

- 90-Day
- 1-Year
- 3-Year
- Other

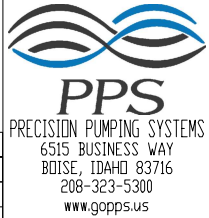
# 1 - PANEL OVERVIEW



Turning water into communities ... one pump station at a time.



A724818FSD  
 A72P48F1  
 SCE-HA1814  
 N360846G100



ENCLOSURE SPEC	
UL TYPE:	NEMA TYPE 3R
MATERIAL:	MILD STEEL
COLOR:	GRAY

INPUT POWER	
480V - 3PH	
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16" PLACE DECIMAL: ±.0625	
DRAWN: WON	DATE: 03.12.2026

ELECTRIC ENCLOSURE SIZE : <b>A724818FSD</b>	
PROJECT : JURUPA REGIONAL PARK VFD PANEL	
PART NO: JURUPA REGIONAL PARK-VFD PANEL [REV:DEFAULT]	
DWG NO: MMC1X050V-483-DPP-J5VDPP-A30VDPP-U3A-TE-FK-BM-PLC6E-HG7C-VZW	
SHEET TITLE: <b>Electrical enclosure layout</b>	
JOB NO: QT.26616	SCALE: NTS
SHEET: 1 : 1	REV -

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# **2 - Control Panel Components**

## **Section 2 Table of Contents**

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### **Section 2.1 - 2.5**

#### **PLC**

**PLC Touchscreen**

**PLC Power Supply**

**Ethernet Switch**

**Wireless Modem**

### **Section 2.6**

**Variable Frequency Drives**

### **Section 2.7 - 2.12**

#### **Contactors**

**Mini Circuit Breaker**

**Thermal-Magnetic Breaker**

**Disconnect Handle**

### **Section 2.13 - 2.15**

#### **Transformer**

**Surge Protection**

**Voltage Monitor**

### **Section 2.16 - 2.20**

#### **Pilot Devices**

### **Section 2.21 - 2.23**

**Electrical Enclosure**

**AC Unit**

**Filter Fan**

**Leading Manufacturer of Pre-Packaged Pump Systems**



### FC6A PLUS CPU MODULES

Part No.	High-speed Counter & Pulse Output	Power	Input	Output	Interface	I/O Points
FC6A-D16R1CEE				Relay Output 2A (240V AC-2A, 30V DC-2A)		
FC6A-D16P1CEE	<ul style="list-style-type: none"> <li>High-speed counter Maximum input frequency: 100kHz</li> <li>Pulse output (*1) Maximum output frequency: 100kHz</li> </ul>	24V DC	24V DC (Sink/Source)	Transistor Source Output 0.5A	Port 1 (USB)	16 points (8/8)
FC6A-D16K1CEE				Transistor Sink Output 0.5A	Port 2 (Ethernet)	
FC6A-D32P3CEE				Transistor Source Output 0.1A	Port 3 (Ethernet)	32 points (16/16)
FC6A-D32K3CEE				Transistor Sink Output 0.1A		

### PRODUCT DESCRIPTION

This next-generation IDEC MicroSmart FC6A Plus PLC performs beyond micro PLC limits. With its 2,060 I/O capacity, it can control large machines or entire small-scale manufacturing facilities, providing more capabilities for the most demanding applications.

### KEY FEATURES

- Dual Ethernet ports
- iOS and Android WindEDIT app
- Maximum 2,060 digital I/O
- Maximum 511 analog I/O
- Bluetooth communication
- BACnet/IP and Modbus TCP



### SPECIFICATIONS

Part No.	FC6A-D16R1CEE FC6A-D16P1CEE FC6A-D16K1CEE	FC6A-D32P3CEE FC6A-D32K3CEE
Rated Power Voltage	24V DC	
Allowable Voltage Range	20.4 to 28.8V DC (including ripple)	
Maximum Power Consumption (CPU module)	FC6A-D16R1CEE: 2.88W (24V DC) FC6A-D16P1CEE: 2.88W (24V DC) FC6A-D16K1CEE: 2.88W (24V DC) FC6A-D32P3CEE: 3.36W (24V DC) FC6A-D32K3CEE: 3.36W (24V DC)	
Inrush Current	95A maximum	
Allowable Momentary Power Interruption	10ms (at rated voltage)	
Operating Temperature	-10 to +55°C (no freezing)	
Storage Temperature	-25 to +70°C (no freezing)	
Relative Humidity	Level RH1 (IEC 61131-2) 10 to 95% (no condensation)	
Altitude	Operation: 0 to 2,000m, 795 to 1,013hPa, Transport: 0 to 3,000m, 701 to 1,013hPa	
Pollution Degree	2 (IEC 60664-1)	
Corrosion Immunity	Free from corrosive gases	
Dielectric Strength	Between power and FE terminals: 500V AC, 1 minute Between transistor output and FE terminals: 500V AC, 1 minute Between power and input terminals: 500V AC, 1 minute Between power and relay output terminals: 2,300V AC, 1 minute Between input and relay output terminals: 2,300V AC, 1 minute	Between input and FE terminals: 500V AC, 1 minute Between relay output and FE terminals: 2,300V AC, 1 minute Between power and transistor output terminals: 500V AC, 1 minute Between input and transistor output terminals: 500V AC, 1 minute

## SPECIFICATIONS CONT.

<b>Insulation Resistance</b>	Between power and FE terminals: 100MΩ or higher (500V DC megger) Between transistor output and FE terminals: 100MΩ or higher (500V DC megger) Between power and input terminals: 100MΩ or higher (500V DC megger) Between power and relay output terminals: 100 MΩ or higher (500V DC megger) Between input and relay output terminals: 100MΩ or higher (500V DC megger)	Between input and FE terminals: 100MΩ or higher (500V DC megger) Between relay output and FE terminals: 100MΩ or higher (500V DC megger) Between power and transistor output terminals: 100 MΩ or higher (500V DC megger) Between input and transistor output terminals: 100 MΩ or higher (500V DC megger)
<b>Noise Resistance</b>	AC/DC power terminals: 1kV, 50ns to 1μs I/O terminals (coupling clamp): 1.5kV, 50ns to 1μs coupling adapter	
<b>Vibration Resistance</b>	5 to 8.4Hz amplitude 3.5mm 8.4 to 150Hz acceleration 9.8m/s <sup>2</sup> (1G), 2 hours per axis on each of three mutually perpendicular axes (IEC 61131-2)	
<b>Shock Resistance</b>	147m/s <sup>2</sup> (15G), 11ms duration, 3 shocks per axis on three mutually perpendicular axes	
<b>Degree of Protection</b>	IP20 (IEC 60529)	
<b>Power Supply Wire</b>	UL1007 AWG24-16, UL2464 AWG24-16, UL1015 AWG20-16	
<b>Grounding Wire</b>	UL1007 AWG16	
<b>Ground</b>	D-type ground (Class 3 ground)	
<b>Mounting</b>	DIN rail or panel mounting	
<b>Weight (approx.)</b>	FC6A-D16R1CEE: 290g FC6A-D16P1CEE: 275g FC6A-D16K1CEE: 275g	FC6A-D32P3CEE: 255g FC6A-D32K3CEE: 255g

## FUNCTION SPECIFICATIONS

<b>Part No.</b>	FC6A-D16R1CEE FC6A-D16P1CEE (*4) FC6A-D16K1CEE (*4)	FC6A-D32P3CEE (*4) FC6A-D32K3CEE (*4)
<b>Control System</b>	Stored program system	
<b>Instruction Words</b>	Basic	42
	Advanced	130
<b>Program Capacity (*1)</b>	800KB (100,000 steps)	
<b>User Program Storage</b>	Serial Flash Memory (100,000 times rewritable)	
<b>Processing Time</b>	Basic Instruction	21μs/1,000 steps
	END Processing (*2)	1ms maximum
<b>I/O Points</b>	Input	8 points      16 points
	Output	8 points      16 points
<b>Expandable Modules</b>	7 modules (*3)	
<b>Expandable I/O Points with Expansion Modules</b>	224 points	
<b>Expandable Modules with Unibody Type Expansion Modules</b>	8 modules	
<b>Expandable I/O Points with Unibody Type Expansion Modules</b>	256 points	
<b>Expandable Modules with Separate Type Expansion Modules (*5)</b>	63 modules (separate type master: 1 module maximum, separate type slave: 10 modules maximum)	
<b>Expandable I/O Points with Separate Type Expansion Modules (*5)</b>	2,016 points	
<b>Internal Relay</b>	15,400 points	
<b>Special Internal Relay</b>	1,600 points	
<b>Shift Register</b>	256 points	
<b>Data Register</b>	60,000 points	
<b>Non-Retentive Data Register</b>	200,000 points	
<b>Special Data Register</b>	900 points	
<b>Counter</b>	512 points	
<b>Timer (1ms, 10ms, 100ms, 1s)</b>	2,000 points	
<b>Clock</b>	Clock accuracy: ±30 sec/month (typical) at 25°C	
<b>RAM Backup</b>	Backup Data	Internal relay, shift register, counter, data register, timer, special data register, special internal relay, clock data
	Battery	Lithium primary battery (BR2032)
	Battery Life	Approx. 4 years
	Replaceability	Possible
<b>Self-diagnostic Function</b>	Keep data, user program sum check (serial flash memory), user program sum check (RAM), timer/counter preset value sum check, user program syntax check, user program execution check, WDT check, user program write check, power failure, clock error, data link connection check, I/O bus initialization check	
<b>Input Filter</b>	0 ms (without filter), 3 to 15ms (selectable in increments of 1ms) I14, I15, I16, I17: 3ms	
<b>Catch Input/Interrupt Input</b>	Six inputs I0, I1, I3, I4, I6, I7 (Minimum turn on pulse width: 5μs max./Minimum turn off pulse width: 5μs max.)	

## USB PORT SPECIFICATIONS

<b>USB Type</b>	USB mini-B
<b>USB Standard</b>	USB 2.0
<b>Isolation</b>	Not isolated from the internal circuit
<b>Communication Function</b>	Maintenance communication to PC

## ETHERNET PORT 1 SPECIFICATIONS

<b>Communication Type</b>	IEEE802.3 compliant
<b>Communication Speed</b>	10BASE-T, 100BASE-TX
<b>Connector</b>	RJ45
<b>Cable</b>	CAT.5STP
<b>Maximum Cable Length</b>	100m
<b>Isolation</b>	Pulse transformer isolation
<b>Communication Function</b>	Maintenance communication (server), user communication (server/client), user communication UDP, Modbus TCP (server/client), Email, Web Server, PING, SNTIP, FTP server/client, BACnet/IP server

## ETHERNET PORT 2 SPECIFICATIONS

<b>Communication Type</b>	IEEE802.3 compliant
<b>Communication Speed</b>	10BASE-T, 100BASE-TX
<b>Connector</b>	RJ45
<b>Cable</b>	CAT.5STP
<b>Maximum Cable Length</b>	100m
<b>Isolation</b>	Pulse transformer isolation
<b>Communication Function</b>	Maintenance communication (server), user communication (server/client), user communication UDP, Modbus TCP (server/client), PING

## FUNCTION SPECIFICATIONS CONT.

High-speed Counter	Maximum Counting Frequency and High-speed Counter Points	Total 6 points Single/two-phase selectable: 100kHz (single-phase: 6 points, two-phase: 3 points)
	Counting Range	0 to 4,294,967,295 (32 bits)
	Operation Mode	Rotary encoder mode, adding counter mode, frequency measurement mode
Analog Potentiometer	Quantity	1 point
	Data Range	0 to 1,000
Analog Voltage Input	Quantity	1 point
	Input Voltage Range	0 to 10V
	Input Impedance	Approx. 100K $\Omega$
	Digital Resolution	Approx. 4,000 steps (12 bits)
Pulse Output (transistor output model only)	Quantity	4 points
	Maximum Output Pulse Frequency	Q0, Q2, Q4, Q6: 100kHz
	Reversible Control	Single-pulse output mode: 4 axis (Q0-Q7), Dual-pulse output mode: 4 axis (Q0-Q7)
	PWM Output	Duty cycle 0.1 to 100.0% (increments of 0.1%), Output pulse frequency 15 to 5,000 Hz (increments of 1 Hz): 4 points (Q0, Q2, Q4, Q6) (Adjust 5 $\mu$ s minimum as ON time and 15 $\mu$ s minimum as OFF time.)
USB Port	USB mini-B (maintenance communication)	
Ethernet Port 1	Maintenance communication (server), user communication TCP (server/client), user communication UDP, Modbus TCP (server/client), Email, Web Server, PING, SNTP, FTP server/client	
Ethernet Port 2	Maintenance communication (server), user communication TCP (server/client), user communication UDP, Modbus TCP (server/client), PING	
Cartridge (option)	Two cartridges can be added (when using FC6A-HPH1)/One cartridge can be added (when using FC6A-PH1)	
SD Card Slot	Embedded	
HMI Module (option)	Yes	

\*1: 1 step equals 8 bytes.

\*2: Not including expansion I/O service time, counter timer processing time, data link processing time, and interrupt processing time.

\*3: A maximum of 5 modules can be connected when using the expansion interface module separate type master.

\*4: Transistor output model

\*5: Communication module cannot be connected.

## INPUT SPECIFICATIONS

Part No.	FC6A-D16R1CEE FC6A-D16P1CEE FC6A-D16K1CEE	FC6A-D32P3CEE FC6A-D32K3CEE
Input Points	8 (8/1 common)	16 (16/1 common)
Rated Input Voltage	24V DC: 24V DC sink/source input signal	
Input Voltage Range	0 to 28.8V DC	
Rated Input Current	High speed input port 5mA/pt, middle/normal speed input port 7mA/pt	
Input Impedance	High speed input port 4.9k $\Omega$ , middle/normal speed input port: 3.4k $\Omega$	
Input Delay	Turn ON Time	High speed input port: 5 $\mu$ s + filter value Middle speed input port: 35 $\mu$ s + filter value Normal speed input port: 35 $\mu$ s + filter value
	Turn OFF Time	High speed input port: 5 $\mu$ s + filter value Middle speed input port: 35 $\mu$ s + filter value Normal speed input port: 100 $\mu$ s + filter value
Isolation	Between input terminals: Not isolated Internal circuit: Optocoupler-isolated	
Input Type	Type1 (IEC 61131-2)	
External Load for I/O Interconnection	Not needed	
Signal Determination Method	Static	
Effect of Improper Input Connection	Both sinking and sourcing input signals can be connected, therefore reverse connection does not cause damage. If any input exceeding the rated value is applied, permanent damage may be caused.	
Cable Length	3m in compliance with electromagnetic immunity	
Connector	Insertion Durability	100 times minimum
	Applicable Ferrule	1-wire: AI 0.5-8 WH (Phoenix Contact) 2-wire: AI-TWIN 2x0.5-8 WH (Phoenix Contact)

## RELAY OUTPUT SPECIFICATIONS

Part No.	FC6A-D16R1CEE	
Relay Output Points	8	
Output Points per Common Line	COM1	4
	COM2	4
Output Type	1NO	
Maximum Load Current	Per Point	2A
	Per Common	COM1: 7A COM2: 7A
Minimum Switching Load	1mA/5V DC (reference value)	
Initial Contact Resistance	30m $\Omega$ maximum	

## RELAY OUTPUT SPECIFICATIONS CONT.

Electrical Life	100,000 operations minimum (rated resistive load 1,800 operations/hour)	
Mechanical Life	20,000,000 operations minimum (no load 18,000 operations/hour)	
Rated Load	Resistive load: 240V AC 2A, 30V DC 2A Inductive load: 240V AC 2A (cos $\phi = 0.4$ ), 30V DC 2A (L/R = 7 ms)	
Connector	Insertion/Removal Durability	100 times minimum
	Applicable Ferrule	1-wire: AI 0.5-8 WH (Phoenix Contact) 2-wire: AI-TWIN 2x0.5-8 WH (Phoenix Contact)

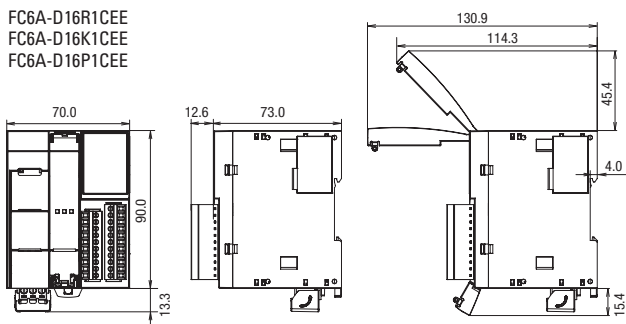
## TRANSISTOR OUTPUT SPECIFICATIONS

Part No.	FC6A-C16P1CEE FC6A-C16K1CEE	FC6A-D32P3CEE FC6A-D32K3CEE
Transistor Output Points	8 (8/1 common)	16 (16/1 common)
Output Type	Transistor Sink	FC6A-D16K1CEE/FC6A-D32K3CEE
	Transistor Source	FC6A-D16P1CEE/FC6A-D32P3CEE
Rated Load Voltage	24V DC	
Voltage Tolerance	19.2 to 28.8V DC	
Rated Load Current	Per Point	0.5A
	Per Common	4.0A
Output Delay	Turn ON Time	High speed input port: 5 $\mu$ s Normal speed input port: 300 $\mu$ s
	Turn OFF Time	High speed input port: 5 $\mu$ s Normal speed input port: 300 $\mu$ s
Isolation	Between output terminal and Internal circuit: Optocoupler-isolated Between output terminals: Not isolated	
Voltage Drop (ON Voltage)	1V max (voltage between COM and output terminal when output is on.)	
Inrush Current	1A	0.2A
Leakage Current	0.1mA maximum	
Clamping Voltage	39V $\pm$ 1V	
Maximum Lamp Load	12W	2.4W
Inductive Load	L/R=10ms (28.8V DC, 1Hz)	
Overcurrent Protection	Transistor Sink Output: No Transistor Source Output: Overcurrent is detected by current limit resistance. (*1)	
External Current Draw	100mA maximum, 24V DC (power voltage at the +V terminal, -V terminal at source)	
Connector	Insertion Durability	100 times minimum
	Applicable Ferrule	1-wire: AI 0.5-8 WH (Phoenix Contact) 2-wire: AI-TWIN 2x0.5-8 WH (Phoenix Contact)

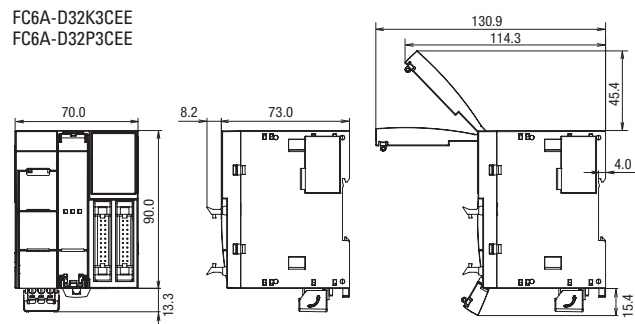
\*1: This overcurrent signals consist of one signal per 4 point outputs. When microprocessor gets this overcurrent signal by interrupt input, microprocessor turns off 4pt outputs of this category at fixed time (approx. 1sec).

## DIMENSIONS (mm)

FC6A-D16R1CEE  
FC6A-D16K1CEE  
FC6A-D16P1CEE



FC6A-D32K3CEE  
FC6A-D32P3CEE



# 7" HMI HG2J Series

Sleek. Stylish. Smart.



## Section 2.2 PLC Touchscreen



### PRODUCT DESCRIPTION

Stylish smart capacitance touchscreens with an input voltage of 12-24V DC make the HG2J HMI a leading choice for applications across a variety of industries, including industrial, solar, and vehicle applications. Offered in a popular size form factor, HG2J uses Projected-Capacitive (PCAP) technology to provide a slimmer and sleeker appearance, small installation footprint, improved performance, and longer life.

An industry-leading three year warranty and exceptionally wide operating temperature range, as well as IP66/67F, Type 4X, 12, 13, and Class I Div 2 approval ratings, assure reliable operation even in the toughest environments.

### KEY FEATURES

- 800 x 480 High Resolution
- 50,000 Hours Backlight Life
- 500 cd/m<sup>2</sup> Brightness
- -20 to +60°C Extreme Operating Temp
- Remote Access, FTP, Email, Mobile App and Custom Web Page
- Support 4 protocols simultaneously



### GENERAL SPECIFICATIONS

<b>Rated Power Voltage</b>	12 to 24V DC
<b>Power Voltage Range</b>	10.2 to 28.8V DC
<b>Power Consumption</b>	13W maximum 5W maximum when not using USB1 or USB2 3W maximum when Backlight OFF
<b>Allowable Momentary Power Interruption</b>	10ms max. (power supply voltage 20.4 to 28.8V DC) 1ms max. (power supply voltage 10.2 to 20.4V DC)
<b>Inrush Current</b>	30A maximum
<b>Dielectric Strength</b>	500V AC, 10 mA, 1 minute between power and FG terminals
<b>Operating Temperature</b>	-20 to +60°C (no freezing)
<b>Operating Humidity</b>	10 to 90%RH (no condensation)
<b>Storage Temperature</b>	-20 to +70°C (no freezing)
<b>Storage Humidity</b>	10 to 90%RH (no condensation)
<b>Pollution Degree</b>	2
<b>Vibration Resistance</b>	5 to 8.4 Hz single amplitude 3.5 mm, 8.4 to 150 Hz acceleration, 9.8M/s <sup>2</sup> on each of three mutually perpendicular axes (IEC61131-2)
<b>Shock Resistance</b>	147m/s <sup>2</sup> , 11ms, 5 shocks on each of three mutually perpendicular axes (IEC61131-2)
<b>Noise Immunity</b>	Fast transient/burst test Power terminals: 2 kV Communication line: 1kV (IEC/EN61131-2)
<b>Electrostatic Discharge</b>	Contact: 6 kV Air: 8kV (IEC/EN61131-2)
<b>Corrosion Immunity</b>	Free from corrosive gases
<b>Mounting</b>	Panel mount (panel thickness: 1.0 to 5.0 mm)
<b>Degree of Protection</b>	When panel thickness is less than 1 to 5mm: IP66F (IEC60529) When panel thickness is less than 1.6 to 5mm: IP66F, IP67F (IEC60529) TYPE 4X, TYPE 13
<b>Dimensions</b>	186 (W) x 128 (H) mm x 30.4 (D) mm
<b>Weight (approx.)</b>	500g

Do not use the HG2J in an environment subject to strong ultraviolet rays, otherwise the LCD quality will deteriorate.

## DISPLAY SPECIFICATIONS

Display	TFT color LCD (TN type)	
Color / Shade	65,536 colors (16-bit color)	
Effective Display Area	154.08 (W) x 85.92 (H) mm	
Display Resolution	800 (W) x 480 (H) pixels	
DPI	0.1926 (W) x 0.179 (H) mm	
View angle	Left/right/top: 80°, bottom 60°	
Backlight	White LED	
Backlight Life	50,000 hours minimum (* 1)	
Brightness	500 cd/m <sup>2</sup> (Typ.) (*2)	
Brightness Adjustment	48 levels	
Backlight Replacement	Not replaceable by user (must be replaced by IDEC)	
Font	Shift_JIS (Japanese) ISO8859-1 (European) GB2312 (Simplified Chinese) BIG5 (Traditional Chinese) KSC5601 (Korean)	ANSI1250 (Central European language) ANSI1251 (Baltic) ANSI1251 (Cyrillic) ASCII (7-seg)
Character Size	8 to 512	
Character Attribute	Blink (1 or 0.5 sec period), reverse	
Graphics	Straight line, polyline, rectangle, circle, arc, circle/ellipse, equilateral polygons (3, 4, 5, 6, 8) picture	
Window Display	3 popup screens + 1 system screen	

\*1) The backlight life is not guaranteed and refers to the time until the brightness reduces by half after use at 25°C. The actual life depends on operating environments and conditions.

\*2) Brightness of the LCD alone at an ambient temperature of 25°C.

## OPERATION SPECIFICATIONS

Switching Element	PCAP (Projected capacitance) method
Multiple Operations	Up to 2 points
Acknowledgement Sound	Electronic buzzer or audio output

## FUNCTION SPECIFICATIONS




Screen Types	Base screen, popup screen, system screen
No. of Screens	Base screen: 3,000 max. Popup screen: 3,015 max.
User Memory	Approx. 24MB
Parts	Bit Button, Word Button, Goto Screen, Print Button, Key Button, Multi Button, Keypad, Numerical Input, Character Input, Pilot Lamp, Multi-State Lamp, Picture Display, Message Display, Message Switching Display, Alarm List Display, Alarm Log Display, Data Log Display, Numerical Display, Bar Graph, Trend Chart, Pie Chart, Meter, Calendar, Bit Write Command, Word Write Command, Goto Screen Command, Print Command, Timer, Screen Script Command, Multi Command
Calendar	Year, Month, Day, Hour, Min., Sec., Day of Week±90 sec per month (at 25°C)
Power Failure Backup Data	Calendar, log data, keep relay, internal register
Backup Time	20 days (Typ.) (*3)

\*3) If the power is cut off for more than 20 days, the error message "Backup data lost" will be displayed at the next start-up and the clock data will be initialized to "00:00:00 January 1, 2000".

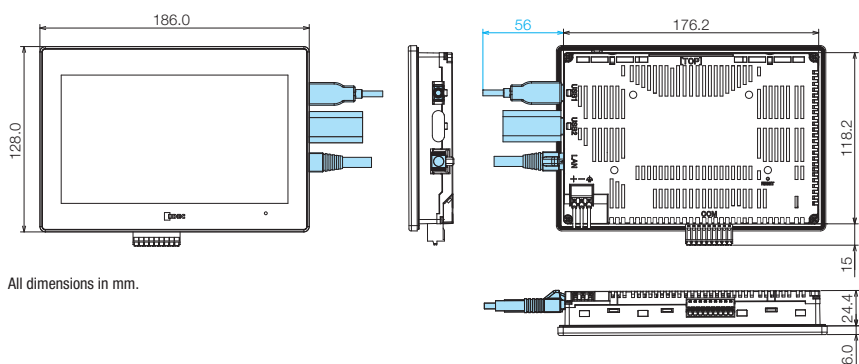
## TOUCHSCREEN PART NUMBER

Part Number	Display Type	Bezel Color
HG2J-7UT22TF-B	7" TFT Color LCD, Projected Capacitive Touchscreen	Black

## ACCESSORIES

Part Number	Description	Quantity
SW1A-W1C	Automation Organizer Software	1
HG9Z-4K2PN04	 Mounting Clip	4
HG9Z-XT09P	 Serial Interface, Removable Push-in Connector	1
HG9Z-2D7PN05	 Protective Sheets	5

## DIMENSIONS (mm)



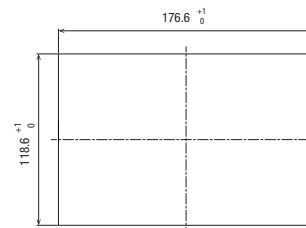
All dimensions in mm.

Dimensions in blue show the mounting dimensions of the cable.

Dimensions in the figure may vary depending on the type of cable connected. The information listed here should be used as a guide for reference when designing.

Install the operator interface into a panel cut-out by tightening the six mounting clips (supplied with the operator interface) to a torque of 0.5 to 0.6 N·m. Do not tighten with excessive force, otherwise the operator interface may become distorted. Also, waterproof characteristics may be lost.

## PANEL CUT-OUT



Panel Thickness: 1.0 to 5.0mm

# Switching Power Supplies

## PS5R-V Series



### Section 2.3 PLC Power Supply



#### STANDARDS COMPLIANCE

Applicable Standards	Mark	File No. or Organization
<ul style="list-style-type: none"> <li>UL508</li> <li>UL1310<sup>1</sup></li> <li>ANSI/ISA 12.12.01</li> <li>CSA C22.2 No.107.1</li> <li>CSA C22.2 No.213</li> <li>CSA C22.2 No.223<sup>1</sup></li> </ul>		<ul style="list-style-type: none"> <li>UL/c-UL Listed</li> <li>File No. E467154, E177168</li> </ul>
<ul style="list-style-type: none"> <li>EN60950-1</li> <li>EN50178</li> <li>EN61204-3</li> <li>EN50581</li> </ul>		
SEMI F47	—	

Note 1: PS5R-VA/VB/VC/VD/VE only  
 Note 2: EN60950-1, EN50178 only

#### POWER SUPPLY PART NUMBERS

Output Capacity	Part Number	Input Voltage	Output Voltage	Output Current
7.5W	PS5R-VA05	100 to 240V AC (Voltage range: 85 to 264V AC / 100 to 370V DC)	5V	1.5A
	PS5R-VA12		12V	0.6A
	PS5R-VA24		24V	0.3A
10W	PS5R-VB05		5V	2.0A
	PS5R-VB12		12V	1.3A
15W	PS5R-VB24		24V	0.65A
	PS5R-VC12		12V	2.5A
30W	PS5R-VC24		24V	1.3A
	PS5R-VD24		24V	2.5A
60W	PS5R-VD24		24V	2.5A
90W	PS5R-VE24	24V	3.75A	
120W	PS5R-VF24	24V	5.0A	
240W	PS5R-VG24	24V	10.0A	

#### Part Number Structure

PS5R - V □ □

Output Voltage  
 05: 5V<sup>3</sup>  
 12: 12V<sup>4</sup>  
 24: 24V

Output Capacity  
 A: 7.5W  
 B: 10W/15W  
 C: 30W  
 D: 60W

E: 90W  
 F: 120W  
 G: 240W

Note 3: PS5R-VA/VB only  
 Note 4: PS5R-VA/VB/VC only  
 Use only for interpreting part numbers.  
 Do not use for developing part numbers.

#### PRODUCT DESCRIPTION

DIN-rail mount switching power supplies with global approvals for both industrial and hazardous locations

#### KEY FEATURES

- Compact size preserves panel space
- Slim size (width):
  - 22.5mm (10W/15W/30W)
  - 36mm (60W/90W)
  - 45mm (7.5W)
  - 46mm (120W)
  - 60mm (240W)
- Universal Voltage Input: 85-264V AC/100-370V DC
- Wide operating temperature range
- Spring-up terminals accept ring & fork terminals
- Approved for use in Class I Division 2 hazardous locations
- Can be installed in 6 directions
- 7.5W ~ 90W meet NEC Class 2 output ratings
- Overcurrent protection with auto-reset
- Meets SEMI F47 Sag Immunity (208V AC input)
- RoHS compliant
- Five-year factory warranty



**SPECIFICATIONS**

Model	5V DC output 12V DC output 24V DC output	PS5R-VA05 PS5R-VA12 PS5R-VA24	PS5R-VB05 PS5R-VB12 PS5R-VB24	- PS5R-VC12 PS5R-VC24	- PS5R-VD24	- PS5R-VE24	- PS5R-VF24	- PS5R-VG24	
<b>Output Capacity</b>		7.5W	15W (5V Model is 10W)	30W	60W	90W	120W	240W	
<b>Rated Input Voltage (Single-phase two-wire)<sup>1</sup></b>		100 to 240V AC (Voltage range: 85 to 264V AC/100 to 370V DC) (Load ≤ 80% at 100-105V DC)							
<b>Frequency</b>		50/60 Hz							
<b>Input</b>	<b>Input Current (Typ.)</b>	100V AC 5V: 0.20A 12V, 24V: 0.18A	5V: 0.25A 12V, 24V: 0.35A	0.7A	1.3A	1.1A	1.4A	2.7A	
		230V AC 5V: 0.12A 12V, 24V: 0.10A	5V: 0.14A 12V, 24V: 0.19A	0.3A	0.8A	0.6A	0.7A	1.2A	
	<b>Inrush Current (Typ.) (Ta=25°C, cold start)</b>	100V AC 15A			18A			14A	
		230V AC 36A		45A			41A	30A	
	<b>Leakage Current</b>	120V AC			0.5mA max.				
		230V AC			1.0mA max.				
	<b>Efficiency (Typ.) (at rated output)<sup>2</sup></b>	100V AC	5V: 74%, 12V: 79%, 24V: 80%	5V: 77%, 12V: 82%, 24V: 84%	12V: 83%, 24V: 85%	86%		88%	89%
	230V AC	5V: 73%, 12V: 77%, 24V: 76%	5V: 73%, 12V: 80%, 24V: 81%	12V: 85%, 24V: 87%	86%		89%	90%	
<b>Power Factor (Typ.)</b>	100V AC	—	—	—	—		0.99		
	230V AC	—	—	—	—	0.86	0.92	0.96	
<b>Rated Voltage/Current</b>	5V/1/5A, 12V/0.6A, 24V/0.3A	5V/2.0A <sup>3</sup> , 12V/1.3A, 24V/0.65A	12V/2.5A, 24V/1.3A	24V/2.5A	24V/3.75A		24V/5A	24V/10A	
<b>Adjustable Voltage Range</b>		±10%							
<b>Output Holding Time (Typ.) (at rated output)</b>	100V AC	5V: 45ms, 12V: 45ms, 24V: 47ms	5V: 53ms, 12V: 34ms, 24V: 36ms	12V: 13ms, 24V: 15ms	13ms	20ms		30ms	
	230V AC	5V: 289ms 12V: 294ms 24V: 282ms	5V: 330ms 12V: 215ms 24V: 230ms	12V: 110ms 24V: 110ms	105ms	30ms	33ms	40ms	
<b>Start Time (at rated input and output)</b>		450ms max.	500ms max.	600ms max.	800ms max.		700ms max.	800ms max.	
<b>Rise Time (at rated input and output)</b>		220ms max	5V, 12V: 200ms max. 24V: 250ms max.			200ms max.			
<b>Output</b>	<b>Input Fluctuation</b>			0.4% max.					
	<b>Load Fluctuation</b>		5V: 2.5% max. 12V, 24V: 1.0% max.			1.0% max.			
	<b>Temperature Change</b>	0.04%/°C max. (-10 to +65°C)	0.05%/°C max. (-10 to +65°C)	12V: 0.05%/°C max. (-10 to +50°C) 24V: 0.05%/°C max. (-10 to +55°C)	0.05%/°C max. (-10 to +55°C)	0.05%/°C max. (-10 to +50°C)	0.05%/°C max. (-25 to +55°C)	0.05%/°C max. (-25 to +50°C)	
	<b>Regulation</b>	<b>Ripple</b>	5V: 8% p-p max. (-25 to -10°C) 12V: 6% p-p max. (-25 to -10°C) 24V: 4% p-p max. (-25 to -10°C)	5V: 8% p-p max. (-25 to -10°C) 12V: 6% p-p max. (-25 to -10°C) 24V: 4% p-p max. (-25 to -10°C)	12V: 6% p-p max. (-25 to -10°C) 24V: 4% p-p max. (-25 to -10°C)		4% p-p max. (-25 to -10°C)		
		<b>(including noise)</b>	5V: 5% p-p max. (-10 to +0°C) 12V: 2.5% p-p max. (-10 to +0°C) 24V: 1.5% p-p max. (-10 to +0°C)	5V: 5% p-p max. (-10 to +0°C) 12V: 2.5% p-p max. (-10 to +0°C) 24V: 1.5% p-p max. (-10 to +0°C)	12V: 2.5% p-p max. (-10 to +0°C) 24V: 1.5% p-p max. (-10 to +0°C)		1.5% p-p max. (-10 to +0°C)		
	5V: 2.5% p-p max. (0 to +65°C) 12V: 1.5% p-p max. (0 to +65°C) 24V: 1% p-p max. (0 to +65°C)	5V: 2.5% p-p max. (0 to +65°C) 12V: 1.5% p-p max. (0 to +65°C) 24V: 1% p-p max. (0 to +65°C)	12V: 1.5% p-p max. (0 to +50°C) 24V: 1% p-p max. (0 to +55°C)	1% p-p max. (0 to +55°C)	1% p-p max. (0 to +50°C)	1% p-p max. (0 to +55°C)	1% p-p max. (0 to +50°C)		
<b>Overcurrent Protection</b>		105% min. (auto reset)				101% min. (auto reset)	105% min. (auto reset)		
<b>Operation Indicator</b>		LED (green)							
<b>Dielectric Strength</b>	Between input and output terminals	3,000V AC, 1 minute							
	Between input and ground terminals	2,000V AC, 1 minute							
	Between output and ground terminals	500V AC, 1 minute							
<b>Insulation Resistance</b>		Between input and output terminals: 100MΩ min. (500V DC megger) Between input and ground terminals: 100MΩ min. (500V DC megger)							
<b>Operating Temperature<sup>4</sup> (No freezing)</b>		-25 to +75°C		-25 to +70°C			-25 to +65°C		
<b>Operating Humidity</b>		20 to 90% RH (no condensation)							
<b>Storage Temperature (No freezing)</b>		-25 to +75°C							
<b>Storage Humidity</b>		20 to 90% RH (no condensation)							
<b>Vibration Resistance</b>		10 to 55Hz, amplitude 0.375mm, 2 hours each in 3 axes (when used with BNL6 end clips)			10 to 55Hz, amplitude 0.33mm, 2 hours each in 3 axes (when used with BNL6 end clips)	10 to 55Hz, amplitude 0.21mm, 2 hours each in 3 axes (when used with BNL6 end clips)	10 to 55Hz, amplitude 0.375mm, 2 hours each in 3 axes (when used with BNL6 end clips)	10 to 55Hz, amplitude 0.375mm, 2 hours each in 3 axes (when used with part no. BNL6 mounting clips)	
<b>Shock Resistance</b>		300 m/s <sup>2</sup> (30G), 3 times each in 6 directions							
<b>Expected Life<sup>5</sup></b>		8 years minimum (at the rated input, 50% load, operating temperature +40°C, standard mounting direction)							
<b>EMC</b>	EMI	EN61204-3 (Class B)							
	EMS	EN61204-3 (industrial)							
<b>Safety Standards</b>		UL508 (Listing), UL1310 Class 2, ANSI/ISA-12.12.01 CSA C22.2 No. 107.1, 213, 223 EN60950-1, EN50178				UL508 (Listing) ANSI/ISA-12.12.01 107.1, 213 EN60950-1, EN50178			CSA C22.2 No.
<b>Other Standard</b>		SEMI F47 (at 208V AC input only)							
<b>Degree of Protection</b>		IP20 (EN60529)							
<b>Dimensions (mm)</b>		75H × 45W × 70D	90H × 22.5W × 95D	95H × 36W × 108D	115H × 46W × 121D	125H × 60W × 125D			
<b>Weight (approx.)</b>		130g	140g	150g	260g	310g	470g	960g	
<b>Terminal Screw</b>		M3.5							

\*At normal temperature and humidity unless otherwise specified. Notes: 1: DC input voltage is not subject to safety standards. When using on DC input, connect a fuse to the input terminal for DC input protection. 2: Under stable state. 3: PS5R-VB05 (5V DC/2.0A) is 10W (Up to 3.0A at Ta = 0 to 40°C. Not subject to safety standards above 2.0A.) 4: See the output derating curves on page 3. 5: Calculation of the expected life is based on the actual life of the aluminum electrolytic capacitor. The expected life depends on operating conditions.

# 8-Port Ethernet Switch



## Section 2.4 Ethernet Switch

### Unmanaged Industrial Ethernet Switch



EtherNet/IP

#### PRODUCT DESCRIPTION

The 8-port unmanaged Ethernet switch is now equipped with the features of managed Ethernet switch.

Designed to meet all communication requirements! The SX5E series of 8-port unmanaged switch supports the IGMP snooping function and QoS function, which automatically prioritizes EtherNet/IP packets. With an industrial-grade design, rugged metal housing and extreme operating temperature, this switch is suitable for industrial applications in harsh environmental conditions.

#### SPECIFICATIONS

Rated Input Voltage	24V DC, 24V AC
Voltage Tolerance	12-48V DC, 18-30V AC
Power Consumption	4.1W
Ethernet Standard	IEEE802.3u (10BASE-TX)/IEEE802.3i (10BASE-T) compliant
Data Transfer Speed	10Mbps/100Mbps (Auto-negotiation function)
Communication Method	All ports full/half duplex (Auto-negotiation function)
Number of Ports	8
Frame Transfer Method	Store and forward
Throughput	1.2Mpps
Address Table	2,048 entries
Buffer Size	4Mbits
EMI/EMS	<ul style="list-style-type: none"> <li>FCC CFR47 Part 15, EN55022, CISPR22, Class A</li> <li>Electrostatic discharge: ±6kV (contact), ±8kV (air) (IEC61000-4-2)</li> <li>Radiation electromagnetic field: 10V/m (80MHz-2GHz), 3V/m (2GHz-2.7GHz) (IEC61000-4-3)</li> <li>FTB: ±2kV (Power Port), ±1kV (Data Port) (IEC61000-4-4)</li> <li>Lighting surge: ±1kV/DM, ±2kV/CM (Power Port), ±1kV (Data Port) (IEC61000-4-5)</li> <li>RF conducted immunity: 10V (150kHz-80MHz) (IEC61000-4-6)</li> </ul>
Vibration Resistance	5Hz to 9Hz: 3.5mm, 9Hz to 150Hz: 2.0G (IEC60068-2-6)
Shock Resistance	150m/s <sup>2</sup> 11ms (IEC60068-2-27)
Operating Temperature	-40 to +75°C (no freezing)
Operating Humidity	5 to 95% RH (no condensation)
Storage Temperature	-40 to +85°C (no freezing)
Mounting	DIN rail/panel mounting (*1)
Degree of Protection	IP30
Weight (approx.)	250g

\*1: Optional accessory is necessary for panel mounting.

#### KEY FEATURES

- 8-Port 10/100Mbps Fast Ethernet
- Supports QoS Function
- Supports IGMP Snooping Function
- Extreme Operating Temperature Range: -40 to +75 °C
- Redundant Power Input Design
- Broadcast Storm Protection
- Rugged Metal Housing
- IP30 Protection
- UL Class I Div 2 Certified (July 2021)



# SX5E Ethernet Switch

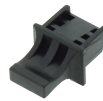
## PART NUMBERS

Model	Part Number
8 port Ethernet Switch	SX5E-HU085B

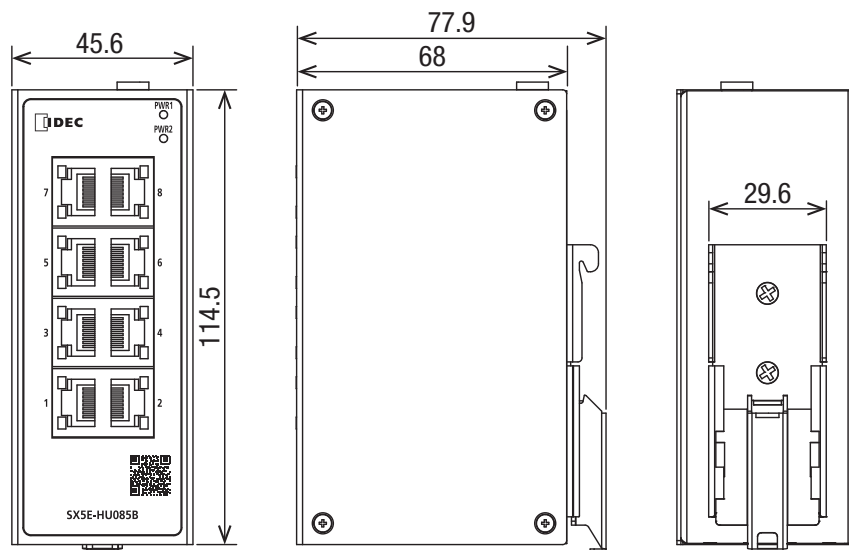


## ACCESSORIES

Model	Part Number	Package Quantity
RJ45 connector cover (IP30)	SX9Z-CAP2PN02	2
Direct mounting bracket	SX9Z-1A01	1
Power Supply Terminal Block	SX9Z-PMTD04PN02	2



## DIMENSIONS (mm)



ALSO AVAILABLE IN 5-PORT STANDARD MODEL



### SX5E 5-PORT UNMANAGED INDUSTRIAL ETHERNET SWITCH

Fast with compact industrial-grade design and rugged metal housing.



# MAX BR1 Mini Industrial-Grade 4G LTE Router



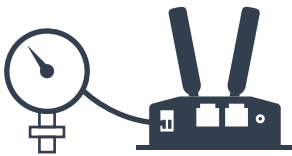
## Rugged 4G LTE Router with Add-On Automatic Failover

The BR1 Mini offers redundant SIM slots with automatic switching, DC or terminal block power capability, advanced GPS fleet tracking, and remote management, all packed into a durable metal enclosure.

### Compatible With:



\*Selected models



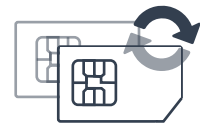
### Out of Band Management, IOT, and M2M Telemetry

Manage and configure your networking devices securely even if the primary line is not available. Gather data from meters, sensors and other remote equipment via RS-232 serial port adapter.



### Add-On WAN Capabilities

The MAX BR1 Mini has an optional license that enables Ethernet and Wi-Fi WAN for failover between different WAN connections.



### Redundant SIM Slots for Multiple Carriers

Redundant SIM slots with automatic switching for reliable networking. You can set the BR1 Mini to automatically switch SIM cards when you're about to exceed a data cap. It also allows you travel across borders without changing SIM cards manually.



### Support for T-Mobile (Band 12) and Sprint\* (Band 26)

The BR1 Mini LTE-A supports Band 12 (700 Mhz) for T-Mobile and Band 26 (850 Mhz) for Sprint\*. These bands penetrate buildings extremely well and also cover longer distances.



### Fleet Tracking and Management

With built-in GPS fleet tracking and InControl cloud-based management, you can keep tabs on location and manage your mobile network from any Internet-connected device.



### Terminal Block for Secure Power Supply

The MAX BR1 Mini is equipped with a terminal block for secure power installation in vehicles and other locations.

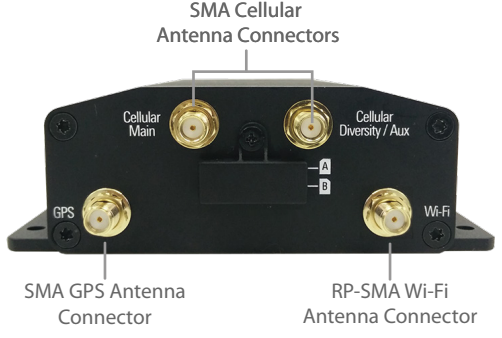
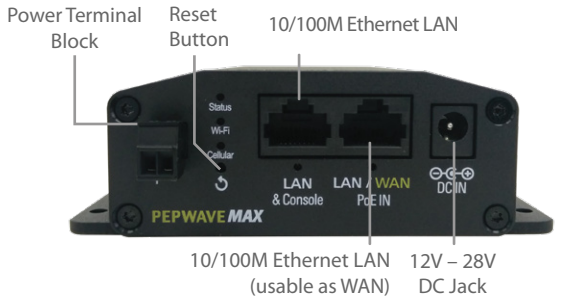
\* Sprint Certification Pending

# MAX BR1 Mini

## Industrial-Grade 4G LTE Router

### Specifications

	MAX BR1 Mini
WAN Interface	1x 10/100M Ethernet Port 1x Embedded LTE Modem with Redundant SIM Slot
LAN Interface	1x 10/100M Ethernet Port
Wi-Fi Interface	802.11b/g/n Wi-Fi WAN or AP
Router Throughput	100 Mbps
Recommended Users	60
LTE Modem	Downlink/Uplink Datarate: 150Mbps/50Mbps
LTE-A Modem	Downlink/Uplink Datarate: 300Mbps/50Mbps
Cellular and GPS Antenna Connector	2x SMA Antenna Connectors 1x SMA GPS Antenna Connector 1x Wi-Fi Connector
Power Input	DC Jack/Terminal Block: 12V – 28V DC Passive PoE Input (WAN Port, 12V – 28V DC)
Power Consumption	12W (max.)
Dimensions	4.1 x 4.3 x 1.2 inches 105 x 110 x 30 mm
Weight	0.54 pound 244 grams
Operating Temperature	-40° – 149°F -40° – 65°C
Humidity	15% – 95% (non-condensing)
Certifications	FCC, CE, RoHS, E-Mark, IC, EN 61373: Shock and Vibration Resistance, EN 50155: Railway Applications - Electronic Equipment used on Rolling Stock, EN 61000: Electromagnetic Compatibility
Warranty	1-Year Limited Warranty



### Ordering Information

	Product Code	Carrier/Region	Embedded Modem	Standard	4G Bands	3G Bands
LTE	MAX-BR1-MINI-LTE-US-T	United States	1	LTE Cat.4	B2, B4, B5, B12, B13	HSPA+: B2, B5
	MAX-BR1-MINI-LTE-E-T	Europe/International	1	LTE Cat.4	4G LTE: B1, B3, B5, B7, B8, B20, B38 (TDD), B40(TDD), B41 (TDD)	WCDMA/HSPA+/DC-HSPA+: B1, B5, B8
LTEA	MAX-BR1-MINI-LTEA-W-T	Americas/EMEA	1	LTE Cat.6	4G LTE-A: B1, B2, B3, B4, B5, B7, B8, B12, B13, B20, B25, B26, B29, B30, B41	2500WCDMA/HSPA+/DC-HSPA+: B1, B2, B3, B4, B5, B8
	MAX-BR1-MINI-LTEA-P-T	Asia Pacific	1	LTE Cat.6	B1, B3, B5, B7, B8, B18, B19, B21, B28, B38, B39, B40, B41	WCDMA/HSPA+/DC-HSPA+: B1, B5, B6, B8, B9, B19 TD-SCDMA: B39

Product Code	Description
MAX-BR1-MINI-LC-FS	Failover software license and related feature set for BR1-MINI, enables Ethernet and Wi-Fi WAN.
ACW-102	PoE injector for delivering passive PoE power to the BR1 Mini

ACQ580 LV AC DRIVES

## Drives for water and wastewater

### 1 to 350 hp



#### Secure the flow

The ACQ580 variable frequency drive (VFD) delivers innovative pumping features for the water and wastewater industry. Primary Setting menu and assistants simplifies commissioning, setup and daily control. Embedded water and wastewater application features create an intuitive environment for users and dedicated pumping features enhance the performance of the pumping system.

#### Speak the language

Leveraging clear, water industry terminology, the control panel enables operators to efficiently interface with the drives in terms they use every day. The optional Bluetooth control panel allows for wireless commissioning and monitoring.

#### Feel the Power

ACQ580 drives are designed for customers who value reliability, high quality, and robustness. With embedded pump functionality, the ACQ580 keeps the pump system operating optimally and efficiently. Product features, such as coated boards and optional compact UL Type 12 enclosures, make the ACQ580 suitable for harsh conditions.

The **ACQ580** is the latest addition to the ABB drives portfolio. This robust, compact and energy efficient drive is designed for securing the flow of water and wastewater in your pumping system.



## Technical data

Power range	1 to 50 hp, 208-240 V, Single Phase 1 to 100 hp, 208-240 V 1 to 350 hp, 440-480 V 2 to 250 hp, 525-600 V
Voltage range	208-240 V, 1-phase input, 3-phase output 208-240 V, 3-phase input, 3-phase output 440-480 V, 3-phase input, 3-phase output 525-600 V, 3-phase input, 3-phase output
Power factor (cosφ) at nominal load	0.98
Efficiency at rated power	98%
Power loss	Approximately 2-3% of rated power
Frequency	50/60 Hz ±5%
Supported motor control	Scalar and vector
Supported motor types	Asynchronous motor, permanent magnet motor (vector), SynRM (vector)
Mains choke	Built-in swinging choke as standard
Degree of protection	UL (NEMA) Type 1 / IP 21, as standard UL (NEMA) Type 12 / IP55, as option
Ambient conditions	-15°C to 40°C. No frost allowed. From +40°C to +50°C with derating 1% per 1°C
Compliance	CE, UL, cUL, CSA, EAC, RCM
Harmonic mitigation	According to IEC 61000-3-12: 2011
Control connections	Two analog inputs, two analog outputs, six digital inputs including thermistor input, three relay outputs, EIA-485 Modbus RTU, safe torque off (STO), external 24 V DC supply input, USB via control panel

### Control and communication options

Optional I/O extension modules	CMOD-01: External 24 V DC/AC and digital I/O extension (2 x relay output and 1 x digital output) CMOD-02: External 24 V and isolated PTC interface CHDI-01: six 115/230V AC digital inputs and two relay outputs
Optional communication extension modules	EtherNet/IP Modbus TCP Profibus- DP ProfiNet DeviceNet
PC tools	Drive composer tool entry, available for free via ABB website Drive composer tool pro
Control panel options	Hand-Off-Auto control panel (ACH-AP-H) as standard delivery Hand-Off-Auto control panel with bluetooth (ACH-AP-W) Control panels feature battery back-up

### Typical applications

- Pumps
- Blowers
- Mixers

### Installation type

- Wall-mounted

### High enclosure class

- UL (NEMA) Type 1 / IP21
- UL (NEMA) Type 12 / IP55

### Motor types

- Induction motors
- Permanent magnet motors
- Synchronous reluctance motors

### Built-in pump functionality

- Intelligent multi-pump control
- Sensorless flow calculation
- Level control
- Soft pipe fill
- Quick ramps
- Pump cleaning
- Dry pump protection
- Motor preheat

### Programmability

- The Drive Composer PC tool provides extensive drive monitoring and process tuning.
- Adaptive programming provides extra flexibility by offering an easy alternative for simple programming needs.

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## ACQ580-01/04

### Technical specifications

Supply connection	
Voltage and power range	
Input voltage (U <sub>i</sub> )	
ACQ580-01-xxxA-2	240 V 1-phase input, 3-phase output
ACQ580-01-xxxA-2	200-240 V 3-phase input, 3-phase output
ACQ580-01-xxxA-4	440-480 V 3-phase input, 3-phase output
ACQ580-01-xxxA-6	525-600 V 3-phase input, 3-phase output
ACQ580-04-xxxA-4	440-480 V 3-phase input, 3-phase output
Input voltage tolerance	10% / -15%
Line Limitations	Max ±3% of nominal phase to phase input voltage
Power Factor (cos φ)	
at nominal load	
ACQ580-01/04	0.98
Efficiency at rated power	
ACQ580-01/04	98%
Power Loss	
	Approximately 2-3% of rated power
Motor connection	
Supported motor control	
	Scalar and vector
Supported motor types	
	Asynchronous motor, permanent magnet motor (vector), SynRM (vector)
Voltage	
	3-phase, from 0 to supply voltage
Frequency	
	0 to 500 Hz
Short Term Overload Capacity	
Variable Torque	110% for 1 min/10min
Peak Overload Capacity	1.35 for 2 second
Variable Torque	2 sec / 1 minute
Switching Frequency	
	2, 4, 8 or 12 kHz (Up to 150 Hp); 1 or 4 kHz (Over 150 Hp), Automatic fold back in case of overload
Acceleration/Deceleration Time	
	0 to 1800 s
Short Circuit Current Rating (-01/04)	
	100 kA (UL) with fusing
External power supply	
ACQ580-01, R6-R9: Standard	1.50 A at 24 V AC / CC ±10% / 36W
ACQ580-01, R1-R5: Optional card	1.04 A at 24 V AC/DC ±10% / 25W
Safety	
Safe Torque Off (STO)	
STO Standard Input	17...30 VDC, 55mA
Degree of Protection	
Degree of protection (IEC/EN 60529)	
ACQ580-01	IP21, IP55
ACQ580-04	IP00
Enclosure types (UL 508C/61800-5-1)	
ACQ580-01	UL (NEMA) type 1 & 12
ACQ580-04	UL Type Open

Inputs and outputs	
2 analog inputs	Selection of Current/Voltage Input mode is user program mable.
Voltage reference	0 (2) to 10 V, R <sub>in</sub> > 200 kΩ
Current reference	0 (4) to 20 mA, R <sub>in</sub> < 100Ω
Potentiometer reference value	10 V ±1% max. 20 mA
2 analog outputs	AO1 is user program mable for current or voltage. AO2 current
Voltage reference	0 to 10 V, R <sub>in</sub> > 100 kΩ
Current reference	0 to 20 mA, R <sub>in</sub> < 500 Ω
Applicable potentiometer	1 kΩ to 10 kΩ
Internal auxiliary voltage	24 V DC ±10%, max. 250 mA
Accuracy	±/- : % full scale range at 25°C (77°F)
Output updating time	2 ms
6 digital inputs	12 to 24 V DC, 10 to 24 V AC, Connectivity of PTC sensors supported by a single digital input, PNP or NPN connection (5 D's with NPN connection). Programmable
Input Updating Time	2 ms
3 relay outputs	Maximum switching voltage 250 V AC/30 V DC. Maximum continuous current 2 A rms. Programmable, Form C
Contact material	Silver Tin Oxide (AgSnO2)
PTC, PT100 and PT1000	Any of the analog inputs, or digital input 6, are configurable for PTC with up to 6 sensors.
Adjustable filters on analog inputs and outputs	
All control inputs isolated from ground and power	
Operation	
Air Temperature	-15 to +40 °C (5 to 104°F) 0°C (32°F) available with derate 0 to -15 °C (32 to 5°F) No Frost Allowed Output derated above +40°C (104°F)
Installation site Altitude	0 to 1000 m (3281 ft) above sea level Output derated above 1000m (3281 ft) up to 4000m (13123ft)
Relative Humidity	5 to 95% No condensation allowed Maximum relative humidity is 60% in the presence of corrosive gasses
Atmospheric pressure	70 to 106 kPa (10.2 to 15.4 PSI) 0.7 to 1.05 atmospheres
Vibration	Risk category IV Certified (IEC 2018)

## ACQ580-01/04

### Technical specifications

Environmental protections	
Chemical Gasses	Class 3C2 (UL Type 1, IP21) Class 3C2 (UL Type 12, IP55)
Note: Conformal coated PCBs	
Solid Particles	Class 3S2 No conductive dust allowed
Pollution degree (IEC/EN 61800-5-1)	Pollution degree 2
Product Compliance	
Standards and directives	
Low Voltage Directive 2006/95/EC	
EMC Directive 2004/108/EC	
6072 1-3-3: 2002	
6072 1-3-1: 1997	
Quality assurance system ISO 9001 and Environmental system ISO 14001	
UL, cUL, CSA and EAC approvals	
Galvanic Isolation according to PELV	
RoHS2 (Restriction of Hazardous Substances)	
EN 61800-5-1: 2007; IEC/EN 61000-3-12;	
EN 61800-3: 2017 + A1: 2012 Category C2 (1st environment restricted distribution);	
Safe torque off (EN 61800-5-2)	
Seismic (IBC, OSHPD)	
EMC (according to EN61800-3)	ACQ580-01 and ACQ580-04 class C2 (1st environment, restricted distribution)
Available Options	
External 24V AC/DC and digital I/O extension (2xRO and 1xDO) (CMOD-01)	
Additional 115/230 V Digital Input (6xDI and 2xRO) (CHDI-01)	
Fieldbus Adapter Modules	EtherNet/IP, Modbus TCP, PROFIBUS-DP, PROFINET, DeviceNet
Operation, Programming and Diagnostic Tool	Drive Composer Pro / Entry
Cold configuration tool (CCA-01)	
Keypad	
Standard	Hand/Off/Auto
Optional	Bluetooth

Storage (in Protective Shipping Package)	
Air Temperature	-40 to +70°C (-40 to +158°F)
Relative Humidity	Less than 95% No condensation allowed Maximum relative humidity is 60% in the presence of corrosive gasses
Chemical Gasses	Class 1C2
Solid Particles	Class 1S2 Contact ABB regarding Class 1S3
Atmospheric pressure	70 to 106 kPa 0.7 to 1.05 atmospheres
Vibration (ISTA)	
R1...R4	In accordance with ISTA 1A
R5...R9	In accordance with ISTA 3E
Transportation (in Protective Shipping Package)	
Air Temperature	-40° to 70°C (-40° to 158°F)
Relative Humidity	Less than 95% No condensation allowed Maximum relative humidity is 60% in the presence of corrosive gasses
Atmospheric Pressure	60 to 106 kPa (8.7 to 15.4 PSI) 0.6 to 1.05 atmospheres
Free Fall	R1: 76 cm (30 in) R2: 61 cm (24 in) R3: 46 cm (18 in) R4: 31 cm (12 in) R5: 25 cm (10 in)
Chemical Gasses	Class 2C2
Solid Particles	Class 2S2
Shock/ Drop (ISTA)	
R1...R4	In accordance with ISTA 1A
R5...R9	In accordance with ISTA 3E
Vibration (ISTA)	
R1...R4	In accordance with ISTA 1A
R5...R9	In accordance with ISTA 3E

## ACQ580-01, wall-mounted drives

Type code sheet

**5HP VFD# ACQ580-01-07A6-4****30HP VFD# ACQ580-01-044A-4****50HP VFD# ACQ580-01-065A-4**

A	C	Q	5	8	0	-	0	1	-					-					+							
Product series			Construction						Size				Voltage			Options										

**Construction**

- 0 1

01 = Wall-mounted, UL (NEMA) Type 1 / IP21, hand-off-auto assistant control panel, conduit box, Quick Start Guide.

**Size**

-

(Output current rating, see table below for details)  
Requires 4-character rating in type code

Voltage	Frame size								
	R1	R2	R3	R4	R5	R6	R7	R8	R9
208 V	04A6	024A	046A	075A	088A	143A	169A	273A	---
	06A6	031A	059A		114A		211A		
	07A5								
	10A6								
	017A								
460 V	02A1	014A	027A	052A	078A	124A	156A	240A	302A
	03A0	023A	034A	065A	096A		180A	260A	361A
	03A5		044A	077A					414A
	04A8								
	06A0								
	07A6								
	012A								
575 V	---	02A7	022A	---	041A	---	099A	144A	192A
		03A9	027A		052A		125A		242A
		06A1	032A		062A				271A
		09A0			077A				
		011A							
		017A							

**Voltage rating**

-

2 = Power ratings valid at nominal output voltage, 208/230V  
4 = Power ratings valid at nominal output voltage, 460V  
6 = Power ratings valid at nominal output voltage, 575V

+

**Option codes**

Letter code followed by 3 characters (see option code pages for details)




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 PRODUCT-DETAILS

**AF65-30-00-13**
**AF65-30-00-13 100-250V50/60HZ-DC Contactor**



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**General Information**

Extended Product Type	AF65-30-00-13
Product ID	1SBL387001R1300
EAN	3471523132634
Catalog Description	AF65-30-00-13 100-250V50/60HZ-DC Contactor
Long Description	<p>The AF65-30-00-13 is a 3 pole - 690 V IEC or 600 UL contactor with screw terminals, controlling motors up to 30 kW / 400 V AC (AC-3) or 50 hp / 480 V UL and switching power circuits up to 105 A (AC-1) or 90 A UL general use. Thanks to the AF technology, the contactor has a wide control voltage range (100-250 V 50/60 Hz and DC), managing large control voltage variations, reducing panel energy consumptions and ensuring distinct operations in unstable networks. Furthermore, surge protection is built-in, offering a compact solution. AF contactors have a block type design, can be easily extended with add-on auxiliary contact blocks and an additional wide range of accessories.</p>

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**Ordering**

Minimum Order Quantity	1 piece
Customs Tariff Number	85364900

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**Popular Downloads**

Instructions and Manuals	1SBC101036M6801
CAD Dimensional Drawing	2CDC001079B0201

## Dimensions

Product Net Width	55 mm
Product Net Depth / Length	111 mm
Product Net Height	125.5 mm
Product Net Weight	0.95 kg

## Technical

Number of Main Contacts NO	3
Number of Main Contacts NC	0
Number of Auxiliary Contacts NO	0
Number of Auxiliary Contacts NC	0
Standards	IEC/EN 60947-1, IEC/EN 60947-4-1, UL 60947-1, UL 60947-4-1, CSA C22.2 No. 60947-1:22, CSA C22.2 No. 60947-4-1:22
Rated Operational Voltage	Main Circuit 690 V
Rated Frequency (f)	Control Circuit 50 / 60 Hz Main Circuit 50 / 60 Hz
Conventional Free-air Thermal Current ( $I_{th}$ )	acc. to IEC 60947-4-1, Open Contactors $\Theta = 40\text{ °C}$ 105 A
Rated Operational Current AC-1 ( $I_e$ )	(690 V) 40 °C 105 A (690 V) 60 °C 90 A (690 V) 70 °C 80 A
Rated Operational Current AC-3 ( $I_e$ )	(415 V) 60 °C 65 A (440 V) 60 °C 65 A (500 V) 60 °C 55 A (690 V) 60 °C 39 A (380 / 400 V) 60 °C 65 A (220 / 230 / 240 V) 60 °C 65 A
Rated Operational Current AC-3e ( $I_e$ )	(415 V) 60 °C 65 A (440 V) 60 °C 65 A (500 V) 60 °C 55 A (690 V) 60 °C 39 A (380 / 400 V) 60 °C 65 A (220 / 230 / 240 V) 60 °C 65 A
Rated Operational Power AC-3 ( $P_e$ )	(400 V) 30 kW (415 V) 37 kW (440 V) 37 kW (500 V) 37 kW (690 V) 37 kW (380 / 400 V) 30 kW (220 / 230 / 240 V) 18.5 kW
Rated Operational Power AC-3e ( $P_e$ )	(415 V) 37 kW (440 V) 37 kW (500 V) 37 kW (690 V) 37 kW (380 / 400 V) 30 kW (220 / 230 / 240 V) 18.5 kW
Rated Short-time Withstand Current Low Voltage ( $I_{cw}$ )	at 40 °C Ambient Temp, in Free Air, from a Cold State 10 s 600 A at 40 °C Ambient Temp, in Free Air, from a Cold State 15 min 110 A at 40 °C Ambient Temp, in Free Air, from a Cold State 1 min 250 A at 40 °C Ambient Temp, in Free Air, from a Cold State 1 s 1000 A at 40 °C Ambient Temp, in Free Air, from a Cold State 30 s 350 A
Maximum Breaking Capacity	cos phi=0.45 (cos phi=0.35 for $I_e > 100$ A) at 440 V 950 A cos phi=0.45 (cos phi=0.35 for $I_e > 100$ A) at 690 V 600 A
Maximum Electrical Switching Frequency	(AC-1) 600 cycles per hour (AC-2 / AC-4) 150 cycles per hour (AC-3) 1200 cycles per hour
Rated Operational Current DC-1 ( $I_e$ )	(110 V) 2 Poles in Series, 40 °C 105 A (110 V) 2 Poles in Series, 60 °C 90 A (110 V) 2 Poles in Series, 70 °C 80 A

	(110 V) 3 Poles in Series, 40 °C 105 A (110 V) 3 Poles in Series, 60 °C 90 A (110 V) 3 Poles in Series, 70 °C 80 A (220 V) 3 Poles in Series, 40 °C 105 A (220 V) 3 Poles in Series, 60 °C 90 A (220 V) 3 Poles in Series, 70 °C 80 A (72 V) 1-Pole, 40 °C 105 A (72 V) 1-Pole, 60 °C 90 A (72 V) 1-Pole, 70 °C 80 A (72 V) 2 Poles in Series, 40 °C 105 A (72 V) 2 Poles in Series, 60 °C 90 A (72 V) 2 Poles in Series, 70 °C 80 A (72 V) 3 Poles in Series, 40 °C 105 A (72 V) 3 Poles in Series, 60 °C 90 A (72 V) 3 Poles in Series, 70 °C 80 A
Rated Operational Current DC-3 ( $I_e$ )	(110 V) 2 Poles in Series, 40 °C 105 A (110 V) 2 Poles in Series, 60 °C 90 A (110 V) 2 Poles in Series, 70 °C 80 A (110 V) 3 Poles in Series, 40 °C 105 A (110 V) 3 Poles in Series, 60 °C 90 A (110 V) 3 Poles in Series, 70 °C 80 A (220 V) 3 Poles in Series, 40 °C 105 A (220 V) 3 Poles in Series, 60 °C 90 A (220 V) 3 Poles in Series, 70 °C 80 A (72 V) 1-Pole, 40 °C 105 A (72 V) 1-Pole, 60 °C 90 A (72 V) 1-Pole, 70 °C 80 A (72 V) 2 Poles in Series, 40 °C 105 A (72 V) 2 Poles in Series, 60 °C 90 A (72 V) 2 Poles in Series, 70 °C 80 A (72 V) 3 Poles in Series, 40 °C 105 A (72 V) 3 Poles in Series, 60 °C 90 A (72 V) 3 Poles in Series, 70 °C 80 A
Rated Operational Current DC-5 ( $I_e$ )	(110 V) 2 Poles in Series, 40 °C 105 A (110 V) 2 Poles in Series, 60 °C 90 A (110 V) 2 Poles in Series, 70 °C 80 A (110 V) 3 Poles in Series, 40 °C 105 A (110 V) 3 Poles in Series, 60 °C 90 A (110 V) 3 Poles in Series, 70 °C 80 A (220 V) 3 Poles in Series, 40 °C 105 A (220 V) 3 Poles in Series, 60 °C 90 A (220 V) 3 Poles in Series, 70 °C 80 A (72 V) 1-Pole, 40 °C 105 A (72 V) 1-Pole, 60 °C 90 A (72 V) 1-Pole, 70 °C 80 A (72 V) 2 Poles in Series, 40 °C 105 A (72 V) 2 Poles in Series, 60 °C 90 A (72 V) 2 Poles in Series, 70 °C 80 A (72 V) 3 Poles in Series, 40 °C 105 A (72 V) 3 Poles in Series, 60 °C 90 A (72 V) 3 Poles in Series, 70 °C 80 A
Rated Insulation Voltage ( $U_i$ )	acc. to IEC 60947-4-1 690 V acc. to UL/CSA 600 V
Rated Impulse Withstand Voltage ( $U_{imp}$ )	6 kV
Maximum Mechanical Switching Frequency	3600 cycles per hour
Rated Control Circuit Voltage ( $U_c$ )	50 Hz 100 ... 250 V 60 Hz 100 ... 250 V DC Operation 100 ... 250 V
Coil Consumption	Average Holding Value 50 / 60 Hz 4 V·A Average Holding Value 50 Hz 4 V·A Average Holding Value 60 Hz 4 V·A Average Holding Value DC 2 W Average Holding Value, from Warm State 2 W
Operate Time	Between Coil De-energization and NC Contact Closing 19 ... 105 ms Between Coil De-energization and NO Contact Opening 17 ... 100 ms Between Coil Energization and NC Contact Opening 38 ... 95 ms Between Coil Energization and NO Contact Closing 42 ... 100 ms
Mounting on DIN Rail	TH35-15 (35 x 15 mm Mounting Rail) acc. to IEC 60715 TH35-7.5 (35 x 7.5 mm Mounting Rail) acc. to IEC 60715
Mounting by Screws (not supplied)	2 x M4 or 2 x M6 screws placed diagonally
Connecting Capacity Main Circuit	Flexible with Ferrule 1/2x 4 ... 35 mm <sup>2</sup> Flexible with Insulated Ferrule 1/2x 4 ... 35 mm <sup>2</sup> Rigid Stranded 1/2x 6 ... 35 mm <sup>2</sup>

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Connecting Capacity Control Circuit	Flexible with Ferrule 1/2x 0.75 ... 2.5 mm <sup>2</sup> Flexible with Insulated Ferrule 1x 0.75 ... 2.5 mm <sup>2</sup> Flexible with Insulated Ferrule 2x 0.75 ... 1.5 mm <sup>2</sup> Rigid Solid 1/2x 1 ... 2.5 mm <sup>2</sup> Rigid Stranded 1/2x 1 ... 2.5 mm <sup>2</sup>
Wire Stripping Length	Control Circuit 10 mm Main Circuit 16 mm
Degree of Protection	acc. to IEC 60529, IEC 60947-1, EN 60529 Coil Terminals IP20 acc. to IEC 60529, IEC 60947-1, EN 60529 Main Terminals IP10
Terminal Type	Screw Terminals

## Technical UL/CSA

Maximum Operating Voltage UL/CSA	Main Circuit 600 V
General Use Rating UL/CSA	(600 V AC) 90 A
Horsepower Rating UL/CSA	(120 V AC) Single Phase 5 hp (200 ... 208 V AC) Three Phase 20 hp (220 ... 240 V AC) Three Phase 25 hp (240 V AC) Single Phase 15 hp (440 ... 480 V AC) Three Phase 50 hp (550 ... 600 V AC) Three Phase 60 hp
Connecting Capacity Main Circuit UL/CSA	Rigid Stranded 1/2x 10-2 AWG
Connecting Capacity Control Circuit UL/CSA	Rigid Solid 1/2x 18-14 AWG Rigid Stranded 1/2x 18-14 AWG
Tightening Torque UL/CSA	Control Circuit 11 in-lb Main Circuit 35 in-lb

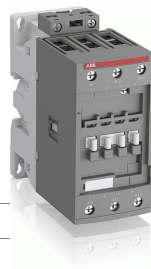
## Environmental

Ambient Air Temperature	Close to Contactor Fitted with Thermal O/L Relay -40 ... 70 °C Close to Contactor without Thermal O/L Relay -40 ... 70 °C Close to Contactor for Storage -60 ... +80 °C
Climatic Withstand	Category B according to IEC 60947-1 Annex Q
Maximum Operating Altitude Permissible	Without Derating 3000 m
Resistance to Vibrations acc. to IEC 60068-2-6	5 ... 300 Hz 3 g closed position / 3 g open position
Resistance to Shock acc. to IEC 60068-2-27	Closed, Shock Direction: A 25 g Closed, Shock Direction: B1 25 g Closed, Shock Direction: B2 15 g Closed, Shock Direction: C1 25 g Closed, Shock Direction: C2 25 g Open, Shock Direction: B1 5 g
RoHS Status	Following EU Directive 2011/65/EU

## Certificates and Declarations

ABS Certificate	ABS_20-2060694-PDA
BV Certificate	BV_2634H36994B1
CB Certificate	CB_SE-108889A1M1
CCC Certificate	CCC_2012010304589737 CCC_2015010304824714
CQC Certificate	CQC2015010304824714 CQC2012010304589737
Declaration of Conformity - CCC	2020980304001256 2020980304001074
Declaration of Conformity - CE	1SBD250000U1000

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Declaration of Conformity - UKCA	1SBD250031U1000
DNV Certificate	DNV_TAE00001AF-4
EAC Certificate	EAC_RU_FRME77B03447
KC Certificate	KC_HW02016-15003C
LR Certificate	LRS_LR2002723TA-02
RINA Certificate	RINA_ELE084013XG
RMRS Certificate	RMRS_1802705280
UL Certificate	UL-US-L312527-1141-10303102-9 UL-CA-L312527-4141-10303102-9
UL Listing Card	UL_E312527

## Container Information

Package Level 1 Units	box 1 piece
Package Level 1 Width	150 mm
Package Level 1 Depth / Length	150 mm
Package Level 1 Height	97 mm
Package Level 1 Gross Weight	1.05 kg
Package Level 1 EAN	3471523132634
Package Level 2 Units	box 10 piece
Package Level 2 Width	250 mm
Package Level 2 Depth / Length	300 mm
Package Level 2 Height	300 mm
Package Level 2 Gross Weight	10.5 kg
Package Level 3 Units	240 piece

## Classifications

Object Classification Code	Q
ETIM 4	EC000066 - Magnet contactor, AC-switching
ETIM 5	EC000066 - Magnet contactor, AC-switching
ETIM 6	EC000066 - Power contactor, AC switching
ETIM 7	EC000066 - Power contactor, AC switching
ETIM 8	EC000066 - Power contactor, AC switching
eClass	V11.0 : 27371003
UNSPSC	39121529
IDEA Granular Category Code (IGCC)	4758 >> Iec Contactors
E-Number (Finland)	3707048
E-Number (Sweden)	3210045

## Categories



## PRODUCT-DETAILS

**AF09-30-10-13****AF09-30-10-13 100-250V50/60HZ-DC****Contactor****General Information**

Extended Product Type	AF09-30-10-13
Product ID	1SBL137001R1310
EAN	3471523110038
Catalog Description	AF09-30-10-13 100-250V50/60HZ-DC Contactor

**Long Description**

The AF09-30-10-13 is a 3 pole - 690 V IEC or 600 UL contactor with 1 built-in auxiliary contact and screw terminals, controlling motors up to 4 kW / 400 V AC (AC-3) or 5 hp / 480 V UL and switching power circuits up to 25 A (AC-1) or 25 A UL general use. Thanks to the AF technology, the contactor has a wide control voltage range (100-250 V 50/60 Hz and DC), managing large control voltage variations, reducing panel energy consumptions and ensuring distinct operations in unstable networks. Furthermore, surge protection is built-in, offering a compact solution. AF contactors have a block type design, can be easily extended with add-on auxiliary contact blocks and an additional wide range of accessories.

**Ordering**

Minimum Order Quantity	1 piece
Customs Tariff Number	85364900

## Popular Downloads

EPLAN Data	9AAC159656_EPLAN
Data Sheet, Technical Information	1SBC100214C0202
Instructions and Manuals	1SBC101027M6801
Instructions and Manuals (Part 2)	1SAC200017M0002
CAD Dimensional Drawing	2CDC001079B0201

## Dimensions

Product Net Width	45 mm
Product Net Depth / Length	77 mm
Product Net Height	86 mm
Product Net Weight	0.27 kg

## Technical

Number of Main Contacts NO	3
Number of Main Contacts NC	0
Number of Auxiliary Contacts NO	1
Number of Auxiliary Contacts NC	0
Number of Poles	3P
Standards	IEC/EN 60947-1, IEC/EN 60947-4-1, UL 60335-2-40 LZGH2 A2L, UL 60947-4-1, CSA C22.2 No. 60335-2-40 LZGH2 A2L, CSA C22.2 No. 60947-4-1
Rated Operational Voltage	Auxiliary Circuit 690 V Main Circuit 690 V
Rated Frequency (f)	Auxiliary Circuit 50 / 60 Hz Control Circuit 50 / 60 Hz Main Circuit 50 / 60 Hz
Conventional Free-air Thermal Current (I <sub>th</sub> )	acc. to IEC 60947-4-1, Open Contactors $\Theta = 40\text{ }^{\circ}\text{C}$ 35 A acc. to IEC 60947-5-1, $\Theta = 40\text{ }^{\circ}\text{C}$ 16 A
Rated Operational Current AC-1 (I <sub>e</sub> )	(690 V) 40 °C 25 A (690 V) 60 °C 25 A (690 V) 70 °C 22 A
Rated Operational Current AC-3 (I <sub>e</sub> )	(415 V) 60 °C 9 A (440 V) 60 °C 9 A (500 V) 60 °C 9.5 A (690 V) 60 °C 7 A (380 / 400 V) 60 °C 9 A (220 / 230 / 240 V) 60 °C 9 A
Rated Operational Current AC-3e (I <sub>e</sub> )	(415 V) 60 °C 9 A (440 V) 60 °C 9 A (500 V) 60 °C 9.5 A (690 V) 60 °C 7 A (380 / 400 V) 60 °C 9 A (220 / 230 / 240 V) 60 °C 9 A
Rated Operational Current AC-15 (I <sub>e</sub> )	(500 V) 2 A (690 V) 2 A (24 / 127 V) 6 A (220 / 240 V) 4 A (400 / 440 V) 3 A

Rated Operational

Current DC-1 ( $I_e$ )

(110 V) 1-Pole, 60 °C 10 A

(110 V) 1-Pole, 70 °C 10 A

(110 V) 2 Poles in Series, 40 °C 25 A

(110 V) 2 Poles in Series, 60 °C 25 A

(110 V) 2 Poles in Series, 70 °C 22 A

(110 V) 3 Poles in Series, 40 °C 25 A

(110 V) 3 Poles in Series, 60 °C 25 A

(110 V) 3 Poles in Series, 70 °C 22 A

(220 V) 2 Poles in Series, 40 °C 10 A

(220 V) 2 Poles in Series, 60 °C 10 A

(220 V) 2 Poles in Series, 70 °C 10 A

(220 V) 3 Poles in Series, 40 °C 25 A

(220 V) 3 Poles in Series, 60 °C 25 A

(220 V) 3 Poles in Series, 70 °C 22 A

(72 V) 1-Pole, 40 °C 25 A

(72 V) 1-Pole, 60 °C 25 A

(72 V) 1-Pole, 70 °C 22 A

(72 V) 2 Poles in Series, 40 °C 25 A

(72 V) 2 Poles in Series, 60 °C 25 A

(72 V) 2 Poles in Series, 70 °C 22 A

(72 V) 3 Poles in Series, 40 °C 25 A

(72 V) 3 Poles in Series, 60 °C 25 A

(72 V) 3 Poles in Series, 70 °C 22 A

## Rated Operational

Current DC-3 ( $I_e$ )

(110 V) 1-Pole, 40 °C 6 A

(110 V) 1-Pole, 60 °C 6 A

(110 V) 1-Pole, 70 °C 6 A

(110 V) 2 Poles in Series, 40 °C 25 A

(110 V) 2 Poles in Series, 60 °C 25 A

(110 V) 2 Poles in Series, 70 °C 22 A

(110 V) 3 Poles in Series, 40 °C 25 A

(110 V) 3 Poles in Series, 60 °C 25 A

(110 V) 3 Poles in Series, 70 °C 22 A

(220 V) 2 Poles in Series, 40 °C 6 A

(220 V) 2 Poles in Series, 60 °C 6 A

(220 V) 2 Poles in Series, 70 °C 6 A

(220 V) 3 Poles in Series, 40 °C 25 A

(220 V) 3 Poles in Series, 60 °C 25 A

(220 V) 3 Poles in Series, 70 °C 22 A

(72 V) 1-Pole, 40 °C 25 A

(72 V) 1-Pole, 60 °C 25 A

(72 V) 1-Pole, 70 °C 22 A

(72 V) 2 Poles in Series, 40 °C 25 A

(72 V) 2 Poles in Series, 60 °C 25 A

(72 V) 2 Poles in Series, 70 °C 22 A

(72 V) 3 Poles in Series, 40 °C 25 A

(72 V) 3 Poles in Series, 60 °C 25 A

(72 V) 3 Poles in Series, 70 °C 22 A

## Rated Operational

Current DC-5 ( $I_e$ )

(110 V) 1-Pole, 40 °C 4 A

(110 V) 1-Pole, 60 °C 4 A

(110 V) 1-Pole, 70 °C 4 A

(110 V) 2 Poles in Series, 40 °C 10 A

(110 V) 2 Poles in Series, 60 °C 10 A

(110 V) 2 Poles in Series, 70 °C 10 A

(110 V) 3 Poles in Series, 40 °C 25 A

(110 V) 3 Poles in Series, 60 °C 25 A

(110 V) 3 Poles in Series, 70 °C 22 A

(220 V) 2 Poles in Series, 40 °C 4 A

(220 V) 2 Poles in Series, 60 °C 4 A

(220 V) 2 Poles in Series, 70 °C 4 A

(220 V) 3 Poles in Series, 40 °C 9 A

(220 V) 3 Poles in Series, 60 °C 9 A

(220 V) 3 Poles in Series, 70 °C 9 A

(72 V) 1-Pole, 40 °C 9 A

(72 V) 1-Pole, 60 °C 9 A

(72 V) 1-Pole, 70 °C 9 A

(72 V) 2 Poles in Series, 40 °C 25 A

(72 V) 2 Poles in Series, 60 °C 25 A

(72 V) 2 Poles in Series, 70 °C 22 A

(72 V) 3 Poles in Series, 40 °C 25 A

(72 V) 3 Poles in Series, 60 °C 25 A

(72 V) 3 Poles in Series, 70 °C 22 A

Rated Operational Current DC-13 ( $I_e$ )	(24 V) 6 A / 144 W (48 V) 2.8 A / 134 W (72 V) 1 A / 72 W (110 V) 0.55 A / 60 W (125 V) 0.55 A / 69 W (220 V) 0.27 A / 60 W (250 V) 0.27 A / 68 W (400 V) 0.15 A / 60 W (500 V) 0.13 A / 65 W (600 V) 0.1 A / 60 W
Rated Operational Power AC-3 ( $P_e$ )	(400 V) 4 kW (415 V) 4 kW (440 V) 4 kW (500 V) 5.5 kW (690 V) 5.5 kW (380 / 400 V) 4 kW (220 / 230 / 240 V) 2.2 kW
Rated Operational Power AC-3e ( $P_e$ )	(415 V) 4 kW (440 V) 4 kW (500 V) 5.5 kW (690 V) 5.5 kW (380 / 400 V) 4 kW (220 / 230 / 240 V) 2.2 kW
Rated Short-time Withstand Current Low Voltage ( $I_{cw}$ )	at 40 °C Ambient Temp, in Free Air, from a Cold State 10 s 150 A at 40 °C Ambient Temp, in Free Air, from a Cold State 15 min 35 A at 40 °C Ambient Temp, in Free Air, from a Cold State 1 min 60 A at 40 °C Ambient Temp, in Free Air, from a Cold State 1 s 300 A at 40 °C Ambient Temp, in Free Air, from a Cold State 30 s 80 A for 0.1 s 140 A for 1 s 100 A
Maximum Breaking Capacity	cos phi=0.45 (cos phi=0.35 for $I_e > 100$ A) at 440 V 250 A cos phi=0.45 (cos phi=0.35 for $I_e > 100$ A) at 690 V 106 A
Rated Insulation Voltage ( $U_i$ )	acc. to IEC 60947-4-1 690 V acc. to IEC 60947-5-1 690 V acc. to UL/CSA 600 V
Rated Impulse Withstand Voltage ( $U_{imp}$ )	6 kV
Maximum Electrical Switching Frequency	(AC-1) 600 cycles per hour (AC-15) 1200 cycles per hour (AC-2 / AC-4) 300 cycles per hour (AC-3) 1200 cycles per hour (DC-13) 900 cycles per hour
Maximum Mechanical Switching Frequency	3600 cycles per hour
Rated Control Circuit Voltage ( $U_c$ )	50 Hz 100 ... 250 V 60 Hz 100 ... 250 V DC Operation 100 ... 250 V
Power Loss	at 6 A per Pole 0.1 W at Rated Operating Conditions AC-1 per Pole 0.8 W at Rated Operating Conditions AC-3 per Pole 0.1 W
Operate Time	Between Coil De-energization and NC Contact Closing 13 ... 98 ms Between Coil De-energization and NO Contact Opening 11 ... 95 ms Between Coil Energization and NC Contact Opening 38 ... 90 ms Between Coil Energization and NO Contact Closing 40 ... 95 ms
Mounting on DIN Rail	TH35-15 (35 x 15 mm Mounting Rail) acc. to IEC 60715 TH35-7.5 (35 x 7.5 mm Mounting Rail) acc. to IEC 60715
Mounting by Screws (not supplied)	2 x M4 Screws Placed Diagonally
Connecting Capacity Main Circuit	Flexible with Ferrule 1/2x 0.75 ... 6 mm <sup>2</sup> Flexible with Insulated Ferrule 1x 0.75 ... 4 mm <sup>2</sup> Flexible with Insulated Ferrule 2x 0.75 ... 2.5 mm <sup>2</sup> Rigid Solid 1/2x 1 ... 4 mm <sup>2</sup> Rigid Stranded 1/2x 1 ... 6 mm <sup>2</sup>
Connecting Capacity Auxiliary Circuit	Flexible with Ferrule 1/2x 0.75 ... 2.5 mm <sup>2</sup> Flexible with Insulated Ferrule 2x 0.75 ... 1.5 mm <sup>2</sup>

	Flexible with Insulated Ferrule 1x 0.75 ... 2.5 mm <sup>2</sup> Rigid Solid 1/2x 1 ... 2.5 mm <sup>2</sup> Rigid Stranded 1/2x 1 ... 2.5 mm <sup>2</sup>
Connecting Capacity Control Circuit	Flexible with Ferrule 1/2x 0.75 ... 2.5 mm <sup>2</sup> Flexible with Insulated Ferrule 1x 0.75 ... 2.5 mm <sup>2</sup> Flexible with Insulated Ferrule 2x 0.75 ... 1.5 mm <sup>2</sup> Rigid Solid 1/2x 1 ... 2.5 mm <sup>2</sup> Rigid Stranded 1/2x 1 ... 2.5 mm <sup>2</sup>
Wire Stripping Length	Auxiliary Circuit 10 mm Control Circuit 10 mm Main Circuit 10 mm
Degree of Protection	acc. to IEC 60529, IEC 60947-1, EN 60529 Auxiliary Terminals IP20 acc. to IEC 60529, IEC 60947-1, EN 60529 Coil Terminals IP20 acc. to IEC 60529, IEC 60947-1, EN 60529 Main Terminals IP20
Tightening Torque	Auxiliary Circuit 1.2 N·m Control Circuit 1.2 N·m Main Circuit 1.5 N·m
Terminal Type	Screw Terminals
Product Name	Block Contactor

## Technical UL/CSA

NEMA Size	00
Continuous Current Rating NEMA	9 A
Horsepower Rating NEMA	(115 V AC) Single Phase 1/3 Hp (200 V AC) Three Phase 1-1/2 Hp (230 V AC) Single Phase 1 Hp (230 V AC) Three Phase 1-1/2 Hp (460 V AC) Three Phase 2 Hp (575 V AC) Three Phase 2 Hp
Maximum Operating Voltage UL/CSA	Main Circuit 600 V
General Use Rating UL/CSA	(600 V AC) 25 A
Horsepower Rating UL/CSA	(120 V AC) Single Phase 3/4 hp (200 ... 208 V AC) Three Phase 2 hp (220 ... 240 V AC) Three Phase 2 hp (240 V AC) Single Phase 1-1/2 hp (440 ... 480 V AC) Three Phase 5 hp (550 ... 600 V AC) Three Phase 7-1/2 hp
Connecting Capacity Main Circuit UL/CSA	Rigid Solid 1/2x 16-10 AWG Rigid Stranded 1/2x 16-10 AWG
Connecting Capacity Auxiliary Circuit UL/CSA	Rigid Solid 1/2x 18-14 AWG Rigid Stranded 1/2x 18-14 AWG
Connecting Capacity Control Circuit UL/CSA	Rigid Solid 1/2x 18-14 AWG Rigid Stranded 1/2x 18-14 AWG
Tightening Torque UL/CSA	Auxiliary Circuit 11 in·lb Control Circuit 11 in·lb Main Circuit 13 in·lb
Full Load Amps Motor Use	(120 V AC) Single Phase 13.8 A (200 ... 208 V AC) Three Phase 7.8 A (220 ... 240 V AC) Three Phase 6.8 A (240 V AC) Single Phase 10 A (440 ... 480 V AC) Three Phase 7.6 A (550 ... 600 V AC) Three Phase 9 A

## Environmental

Ambient Air Temperature	Close to Contactor Fitted with Thermal O/L Relay -25 ... 60 °C Close to Contactor without Thermal O/L Relay -40 ... 70 °C Close to Contactor for Storage -60 ... +80 °C
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AF09-30-10-13

Climatic Withstand	Category B according to IEC 60947-1 Annex Q
Maximum Operating Altitude Permissible	Without Derating 3000 m
Resistance to Shock acc. to IEC 60068-2-27	Closed, Shock Direction: B1 25 g Open, Shock Direction: B1 5 g Shock Direction: A 30 g Shock Direction: B2 15 g Shock Direction: C1 25 g Shock Direction: C2 25 g
Resistance to Vibrations	4g Closed Position & 2g Open position 5 ... 300 Hz
Pollution Degree	3

## Material Compliance

Conflict Minerals Reporting Template (CMRT)	9AKK108467A5658
REACH Declaration	2CMT2021-006202
RoHS Declaration	2CMT2021-006277
RoHS Information	Following EU Directive 2011/65/EU and Amendment 2015/863 July 22, 2019
SCIP	985c900c-1c52-441e-9ef8-189ad537734b China
Simplified SCIP	c0fe3a39-f91c-4e98-9560-ae259339e14b Belgium 3ef78294-3403-47aa-9821-b709595ce32c Bulgaria 55393582-02e7-4351-90ec-d7f12e1c42b1 Estonia f5cad04b-2a5e-4fc7-9dd8-f168a618bd4d Finland 1714317d-48cd-4bfa-8178-7576c107755a Belgium def4f81c-b690-4481-95c3-f85fe209323f Portugal ac2d33e0-b054-4de1-903d-b12ae377a944 Spain 87cd9ee0-e9d2-4f9a-b1cd-6c38fc30d6cc Greece d180bc1c-8501-4867-8bee-8ea533c68bf1 Norway ce1df4b3-2ced-4709-b052-07d587a3f491 Hungary 87c7b1db-75f2-4a5d-abfc-b74f9d3c8f6b Hungary 9a35863b-2625-4170-bc84-0f7975eb33a7 Germany 837a0c89-60e8-47f5-8be2-1ea44f0dd374 Germany b74d9cda-c1aa-4e44-b534-e41cfb48f1ee Sweden 30dfc167-dbd5-4812-919a-8056c0c1f743 Germany 00910b0b-0300-439b-9723-2f2bbcb41e58 Denmark b6ecffbd-8a09-4fcc-92a5-09cf7dcf2c13 Netherlands 785aed0c-6c62-42bb-80c3-f5c47b3b2282 Poland b7c1e8c7-a3e4-4104-982f-8dff0ef39a2 Poland 0ba340ef-9f44-421f-8cb8-8b855a0fcb5 Germany d9c2504e-33d8-43a3-806d-4e8f5005591e Poland 01dae348-827b-4a1f-8034-9a8afb315ff6 France a6d0aa88-03d7-470d-87f8-c450c45c3bc Sweden b045c12b-2dfa-4a33-a8d6-07d8e1b17d58 Germany 94110c54-a437-4795-a9f8-a07ccb04d598 France 64f0f64c-3a77-4b18-9b44-7d3b1c0ca93b Czech Republic ec3df316-8078-4484-a2b3-dcf266e83097 Croatia
Toxic Substances Control Act - TSCA	2CMT2023-006525
WEEE B2C / B2B	Business To Business
WEEE Category	5. Small Equipment (No External Dimension More Than 50 cm)

## ABB EcoSolutions

ABB EcoSolutions	Yes
ABB Site Meeting Group Waste To Landfill Target	No non-hazardous waste is sent to a landfill
End Of Life Disassembling Instructions	1SBC101080M6801
Environmental Product	1SBD250584E3000

AF09-30-10-13

## Declaration - EPD

Improved Energy Efficiency for Customers	Product Efficiency - Product considered more energy-efficient compared to similar product on market or older products from the same line
Recyclability Rate of the Product acc. to EN45555	Design for Closing Resource Loops - Standard EN45555 - 92.7 %

## Certificates and Declarations

A2L Certificate – UL	9AKK108469A4875 9AKK108469A4879
ABS Certificate	ABS_20-2060694-PDA
BV Certificate	BV_2634H24898C1
CB Certificate	CB_SE-113345
CCC Certificate	CCC_2024010304656669
CQC Certificate	CQC2010010304445624 CQC2020010304298240
Declaration of Conformity - CCC	2020980304001253 2020980304001082
Declaration of Conformity - CE	1SBD250000U1000
Declaration of Conformity - UKCA	1SBD250031U1000
DNV Certificate	DNV_TAE00001AF-4
GOST Certificate	GOST_POCCFR.ME77.B07175.pdf
KC Certificate	KC_HW02016-15004C
LR Certificate	LRS_LR23403517TA-02
RINA Certificate	RINA_ELE142224XG
RMRS Certificate	RMRS_1802705280
UL Certificate	UL-US-2150887-5 UL-CA-2142658-5
UL Listing Card	E312527

## Container Information

Package Level 1 Units	box 1 piece
Package Level 1 Width	87 mm
Package Level 1 Depth / Length	79 mm
Package Level 1 Height	47 mm
Package Level 1 Gross Weight	0.27 kg
Package Level 1 EAN	3471523110038
Package Level 2 Units	box 27 piece
Package Level 2 Width	250 mm
Package Level 2 Depth / Length	300 mm
Package Level 2 Height	315 mm
Package Level 2 Gross Weight	7.29 kg

## External Classifications and Standards

Object Classification Code	Q
ETIM 7	EC000066 - Power contactor, AC switching
ETIM 8	EC000066 - Power contactor, AC switching

AF09-30-10-13

ETIM 9	EC000066 - Power contactor, AC switching
eClass	V11.0 : 27371003
UNSPSC	39121529
IDEA Granular Category Code (IGCC)	4758 >> lec Contactors
E-Number (Finland)	3706201
E-Number (Sweden)	3210009

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## Categories

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Low Voltage Products and Systems → Control Products → Contactors → Block Contactors → AF Contactors → AF09



AF40-30-11-13



## Section 2.9 Contactor

### General Information

<b>Extended Product Type:</b>	AF40-30-11-13
<b>Product ID:</b>	1SBL347001R1311
<b>EAN:</b>	3471523132139
<b>Catalog Description:</b>	AF40-30-11-13 100-250V50/60HZ-DC Contactor
<b>Long Description:</b>	AF40 contactors are used for controlling power circuits up to 690 V AC and 220 V DC. They are mainly used for controlling 3-phase motors, non-inductive or slightly inductive loads. AF... contactors include an electronic coil interface accepting a wide control voltage $U_c$ min. ... $U_c$ max. Only four coils cover control voltages between 24...500 V 50/60 Hz or 20...500 V DC. AF contactors can manage large control voltage variations. One coil can be used for different control voltages used worldwide without any coil change. AF contactors have built-in surge protection and do not require additional surge suppressors. The AF... series 2-stack 3-pole contactors are of the block type design. - Main poles and auxiliary contact blocks: 3 main poles with side-mounted 1 N.O. + 1 N.C. auxiliary contact block, front-mounted add-on auxiliary contact blocks (mechanically-linked auxiliary contacts compliant with Annex L of IEC 60947-5-1 including the "Mechanically Linked" symbol on the contactor side. N.C. mirror contacts compliant with Annex F of IEC 60947-4-1) - Control circuit: AC or DC operated - Accessories: a wide range of accessories is available. Note: 2-stack contactors available in some countries: please consult your ABB representative. AF...-30...-11 not suitable for a direct control by PLC-output.

### Categories

Products » Low Voltage Products and Systems » Control Products » Contactors » Block Contactors

### Ordering

<b>EAN:</b>	3471523132139
<b>Minimum Order Quantity:</b>	1 piece
<b>Customs Tariff Number:</b>	85369085

### Dimensions

<b>Product Net Width:</b>	67.0 mm
<b>Product Net Depth:</b>	111.0 mm
<b>Product Net Height:</b>	125.5 mm
<b>Product Net Weight:</b>	0.990 kg

### Container Information

<b>Package Level 1 Units:</b>	1 piece
<b>Package Level 1 Width:</b>	150 mm
<b>Package Level 1 Length:</b>	150 mm
<b>Package Level 1 Height:</b>	87 mm
<b>Package Level 1 Gross Weight:</b>	1.09000 kg
<b>Package Level 1 EAN:</b>	3471523132139

### Environmental

<b>Ambient Air Temperature:</b>	Close to Contactor for Storage -60...+80 °C Close to Contactor Fitted with Thermal O/L Relay -25 ... +60 °C Close to Contactor without Thermal O/L Relay -40 ... +70 °C
<b>Maximum Operating Altitude Permissible:</b>	3000 m
<b>Resistance to Shock acc. to IEC 60068-2-27:</b>	Closed, Shock Direction: A 25 g Closed, Shock Direction: B1 25 g Closed, Shock Direction: B2 15 g Closed, Shock Direction: C1 25 g Closed, Shock Direction: C2 25 g Open, Shock Direction: B1 5 g
<b>Resistance to Vibrations acc. to IEC 60068-2-6:</b>	5...300 Hz 3 g closed position / 3 g open position

### Technical

<b>Rated Operational Power AC-3 (<math>P_e</math>):</b>	(220 / 230 / 240V) 11 kW (380 / 400V) 18.5 kW (415V) 22 kW (440V) 22 kW (500V) 22 kW (690V) 22 kW
<b>Rated Operational Current AC-1 (<math>I_e</math>):</b>	(690V) 40°C 70 A (690V) 60°C 60 A (690V) 70°C 50 A
<b>Number of Main Contacts NO:</b>	3
<b>Number of Main Contacts NC:</b>	0

Number of Auxiliary Contacts NO:	1
Number of Auxiliary Contacts NC:	1
Rated Control Circuit Voltage (U <sub>c</sub> ):	50 Hz 100...250 V 60 Hz 100...250 V DC Operation 100...250 V
Terminal Type:	Screw Terminals

#### Technical UL/CSA

Tightening Torque UL/CSA:	Auxiliary Circuit 11 in-lb Control Circuit 11 in-lb Main Circuit 35 in-lb
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#### Certificates and Declarations (Document Number)

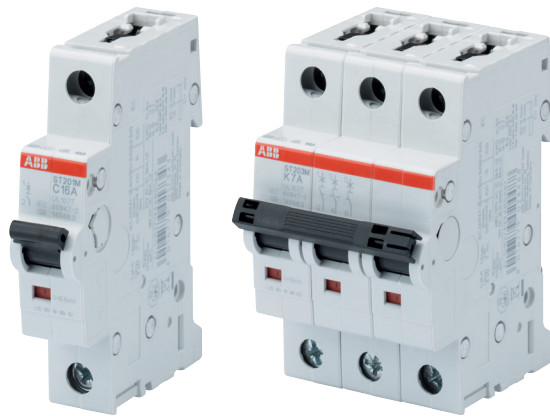
CB Certificate:	<a href="#">CB_SE_72130A1</a>
CCC Certificate:	<a href="#">CCC_2012010304589737</a>
cUL Certificate:	<a href="#">UL_20130926-E312527_14_1</a>
Declaration of Conformity - CE:	<a href="#">1SBD250176C3000</a>
EAC Certificate:	<a href="#">EAC_RU C-FR ME77 B01010</a>
GL Certificate:	<a href="#">GL_60841-13HH</a>
LR Certificate:	<a href="#">LRS_1300087E1</a>
RINA Certificate:	<a href="#">RINA_ELE084013XG</a>
RMRS Certificate:	<a href="#">RMRS_1400682124</a>
RoHS Information:	<a href="#">1SBD251021E1000</a>



### MINIATURE CIRCUIT BREAKERS

## ST200M Datasheet

Supplementary protection acc. to CSA C22.2 No. 235 / UL 1077



The ST200M miniature circuit breaker provides supplementary protection acc. to UL 1077 up to 480 Y/277 V AC and 125 V DC.

With a broad range of options and approvals acc. to the international standards UL, CSA and IEC, the ST 200 M is ideal for multiple applications and markets.

It is also fully compatible with System pro M compact® accessories.

—  
01 ST201M / ST203M  
miniature circuit breakers

#### Features

- High performance MCB with interrupt rating up to 10 kA
- Certified for AC and DC use acc. to UL 1077 and CSA 22.2 No. 235
- Suitable for many applications due to a wide range of product types and available accessories
- High calibration temperature of 40 °C for reduced derating in ICP applications
- Short-circuit current rating (SC) U2 enables continuous high level short circuit protection
- Laser printing provides clear product information on device
- Clear contact position indication in red/green ("real CPI")
- Unique, patented twin terminal for wiring up to 35 mm<sup>2</sup> with captive screws
- Field wiring available for most types
- Robust thermoplastic housing material for better protection against external influences

#### Standards and approvals

##### Standards

UL 1077

CSA 22.2 No. 235

IEC/EN 60947-2

##### Approvals

UL 1077

US

CSA 22.2 No. 235

CA

VDE

DE

CCC

CN

EAC

RU

## Miniature Circuit Breaker ST200M

### Ordering data characteristic C

1 pole	Box Qty	Weight each (kg)	Rated Current	Part number
	10	0.115	0.5 A	ST201M-C0.5
			1.0 A	ST201M-C1
			1.6 A	ST201M-C1.6
			2.0 A	ST201M-C2
			3.0 A	ST201M-C3
			4.0 A	ST201M-C4
			5.0 A	ST201M-C5
			6.0 A	ST201M-C6
			7.0 A	ST201M-C7
			8.0 A	ST201M-C8
			10.0 A	ST201M-C10
			13.0 A	ST201M-C13
			15.0 A	ST201M-C15
			16.0 A	ST201M-C16
			20.0 A	ST201M-C20
			25.0 A	ST201M-C25
			30.0 A	ST201M-C30
			32.0 A	ST201M-C32
			35.0 A	ST201M-C35
			40.0 A	ST201M-C40
			50.0 A	ST201M-C50
			60.0 A	ST201M-C60
			63.0 A	ST201M-C63



1 pole + Neutral	Box Qty	Weight each (kg)	Rated Current	Part number
	5	0.230	0.5 A	ST201M-C0.5NA
			1.0 A	ST201M-C1NA
			1.6 A	ST201M-C1.6NA
			2.0 A	ST201M-C2NA
			3.0 A	ST201M-C3NA
			4.0 A	ST201M-C4NA
			5.0 A	ST201M-C5NA
			6.0 A	ST201M-C6NA
			7.0 A	ST201M-C7NA
			8.0 A	ST201M-C8NA
			10.0 A	ST201M-C10NA
			13.0 A	ST201M-C13NA
			15.0 A	ST201M-C15NA
			16.0 A	ST201M-C16NA
			20.0 A	ST201M-C20NA
			25.0 A	ST201M-C25NA
			30.0 A	ST201M-C30NA
			32.0 A	ST201M-C32NA
			35.0 A	ST201M-C35NA
			40.0 A	ST201M-C40NA
			50.0 A	ST201M-C50NA
			60.0 A	ST201M-C60NA
			63.0 A	ST201M-C63NA



2 poles	Box Qty	Weight each (kg)	Rated Current	Part number
	5	0.230	0.5 A	ST202M-C0.5
			1.0 A	ST202M-C1
			1.6 A	ST202M-C1.6
			2.0 A	ST202M-C2
			3.0 A	ST202M-C3
			4.0 A	ST202M-C4
			5.0 A	ST202M-C5
			6.0 A	ST202M-C6
			7.0 A	ST202M-C7
			8.0 A	ST202M-C8
			10.0 A	ST202M-C10
			13.0 A	ST202M-C13
			15.0 A	ST202M-C15
			16.0 A	ST202M-C16
			20.0 A	ST202M-C20
			25.0 A	ST202M-C25
			30.0 A	ST202M-C30
			32.0 A	ST202M-C32
			35.0 A	ST202M-C35
			40.0 A	ST202M-C40
			50.0 A	ST202M-C50
			60.0 A	ST202M-C60
			63.0 A	ST202M-C63



3 poles	Box Qty	Weight each (kg)	Rated Current	Part number
	1	0.345	0.5 A	ST203M-C0.5
			1.0 A	ST203M-C1
			1.6 A	ST203M-C1.6
			2.0 A	ST203M-C2
			3.0 A	ST203M-C3
			4.0 A	ST203M-C4
			5.0 A	ST203M-C5
			6.0 A	ST203M-C6
			7.0 A	ST203M-C7
			8.0 A	ST203M-C8
			10.0 A	ST203M-C10
			13.0 A	ST203M-C13
			15.0 A	ST203M-C15
			16.0 A	ST203M-C16
			20.0 A	ST203M-C20
			25.0 A	ST203M-C25
			30.0 A	ST203M-C30
			32.0 A	ST203M-C32
			35.0 A	ST203M-C35
			40.0 A	ST203M-C40
			50.0 A	ST203M-C50
			60.0 A	ST203M-C60
			63.0 A	ST203M-C63



Section 2.11  
Thermal Magnetic Breaker



Technical catalog - Preliminary

SACE Tmax XT UL/CSA

New low voltage molded case circuit breakers up to 250A for UL 489 and CSA C22.2 Standards

# Ordering codes for XT3 UL/CSA

## Circuit breakers

### XT3 225A TMF - Fixed (F) - 3 poles - Front terminals (F) - UL/CSA

Thermal magnetic trip unit			Int Rtnng (480 V)	N 25kA Part number	S 35kA Part number
Type	In	I <sub>3</sub>			
TMF	60	600		XT3NU3060AFF000XXX	XT3SU3060AFF000XXX
	70	700		XT3NU3070AFF000XXX	XT3SU3070AFF000XXX
	80	800		XT3NU3080AFF000XXX	XT3SU3080AFF000XXX
	90	900		XT3NU3090AFF000XXX	XT3SU3090AFF000XXX
	100	1000		XT3NU3100AFF000XXX	XT3SU3100AFF000XXX
	110	1100		XT3NU3110AFF000XXX	XT3SU3110AFF000XXX
	125	1250		XT3NU3125AFF000XXX	XT3SU3125AFF000XXX
	150	1500		XT3NU3150AFF000XXX	XT3SU3150AFF000XXX
	175	1750		XT3NU3175AFF000XXX	XT3SU3175AFF000XXX
	200	2000		XT3NU3200AFF000XXX	XT3SU3200AFF000XXX
	225	2250		XT3NU3225AFF000XXX	XT3SU3225AFF000XXX

### XT3 225A TMF - Fixed (F) - 4 poles - Front terminals (F) - UL/CSA

Thermal magnetic trip unit			Int Rtnng (480 V)	N 25kA Part number	S 35kA Part number
Type	In	I <sub>3</sub>			
TMF	60	600		XT3NU4060AFF000XXX	XT3SU4060AFF000XXX
	70	700		XT3NU4070AFF000XXX	XT3SU4070AFF000XXX
	80	800		XT3NU4080AFF000XXX	XT3SU4080AFF000XXX
	90	900		XT3NU4090AFF000XXX	XT3SU4090AFF000XXX
	100	1000		XT3NU4100AFF000XXX	XT3SU4100AFF000XXX
	110	1100		XT3NU4110AFF000XXX	XT3SU4110AFF000XXX
	125	1250		XT3NU4125AFF000XXX	XT3SU4125AFF000XXX
	150	1500		XT3NU4150AFF000XXX	XT3SU4150AFF000XXX
	175	1750		XT3NU4175AFF000XXX	XT3SU4175AFF000XXX
	200	2000		XT3NU4200AFF000XXX	XT3SU4200AFF000XXX
	225	2250		XT3NU4225AFF000XXX	XT3SU4225AFF000XXX

### XT3 225A MCP (MA) - Fixed (F) - 3 poles - Front terminals (F) - UL/CSA

Magnetic trip unit			Int Rtnng (480 V)	S 35 kA Part number
Type	In	I <sub>3</sub>		
MCP	100	600...1200		XT3SU3100MFF000XXX
	110	660...1320		XT3SU3110MFF000XXX
	125	750...1500		XT3SU3125MFF000XXX
	150	900...1800		XT3SU3150MFF000XXX
	200	1200...2400		XT3SU3200MFF000XXX

**XT3 225A switch - Fixed (F) - 3 poles - Front terminals (F) - UL/CSA**

No trip unit			Int Rtnng (480 V)	N	S		
Type	In	Mag. Override		25kA Part number	35kA Part number		
XT3 - D	225	2250		XT3NU3225DFF000XXX	XT3SU3225DFF000XXX		

**XT3 225A switch - Fixed (F) - 4 poles - Front terminals (F) - UL/CSA**

No trip unit			Int Rtnng (480 V)	N	S		
Type	In	Mag. Override		25kA Part number	35kA Part number		
XT3 - D	225	2250		XT3NU4225DFF000XXX	XT3SU4225DFF000XXX		




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 PRODUCT-DETAILS

**OHB65L10B**
**OHB65L10B HANDLE**

**SPECIFICATIONS**

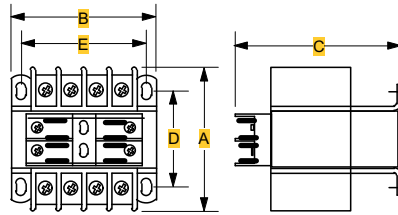
<b>Manufacturer Part Number</b>	OHB65L10B OHB65L10B
<b>Item Number Manufacturer</b>	ABB
<b>Family Series</b>	ABB Industrial Accessories 2.56 Inches
<b>Handle Length Padlockable</b>	No
<b>Color</b>	Black
<b>NEMA Rating</b>	NEMA 4;NEMA 4X
<b>Defeatable</b>	No
<b>Handle Type</b>	Pistol Handle
<b>Net Weight</b>	0.29 lbs
<b>Gross Weight</b>	0.315 lbs

## Transformers



X4045SF1

**Primary voltage** — 460/230/208V, 480/240V, 440/220/200V  
**Secondary voltage** — 115/24V <sup>Ⓢ</sup>, 120/25V, 110/23V  
**Use Class CC fuse**



Top View

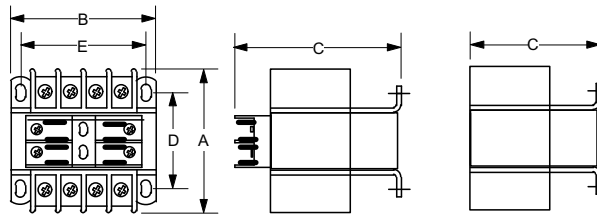
Side View

VA Rating	Catalog number	Output Amps 24/115	Dimensions										Mounting slots			
			A		B		C		D		E		in		mm	
45	X4045SF1	1.90 / 0.39	4½	115	3	76	3⅜	80	2⅞	72	2½	64	⅜	115	5 x 12	
50	X4050PSF1	2.08 / 0.44	4½	115	3	76	4	102	2⅞	72	2½	64	⅜	115	5 x 12	
75	X4075PSF1	3.13 / 0.65	4½	114	3⅝	86	4 ⅜	110	2¾	71	2¾	71	⅜	115	5 x 12	
100	X4100PSF1	4.17 / 0.87	4½	115	3¾	95	4⅝	118	3	76	3⅜	80	⅜	115	5 x 12	
150	X4150PSF1	6.25 / 1.30	5	128	3¾	95	4⅝	118	3⅜	81	3⅜	80	⅜	115	5 x 12	
200	X4200PSF1	8.33 / 1.74	4⅝	111	4½	114	5¼	134	3¾	76	3¾	95	⅜	115	5 x 12	
250	X4250PSF1	10.42 / 2.17	4¾	120	4½	114	5¼	134	3¾	76	3¾	95	⅜	115	5 x 12	
<b>300</b>	<b>X4300PSF1</b>	<b>12.50 / 2.61</b>	<b>6⅞</b>	<b>155</b>	<b>5¼</b>	<b>133</b>	<b>6</b>	<b>151</b>	<b>3⅞</b>	<b>98</b>	<b>4⅝</b>	<b>111</b>	<b>⅞</b>	<b>115</b>	<b>8 x 27</b>	
350	X4350PSF1	14.58 / 3.04	6⅞	155	5¼	133	6	151	3⅞	98	4⅝	111	⅞	115	8 x 27	
500	X4500PSF1	20.84 / 4.35	7⅞	181	5¼	133	5⅝	131	5.37	136	4⅝	111	⅞	115	8 x 27	



X4750PSF1

**Primary voltage** — 460/230/208V, 480/240V, 440/220/200V  
**Secondary voltage** — 115V, 120V, 110V  
**Use Class CC fuse**



Top View

Side View

Side View

VA Rating	Catalog Number	Output Amps	Dimensions										Mounting slots			
			A		B		C		D		E		in		mm	
750	X4750PS1	6.52	7⅞	193	5¼	133	6	151	5¾	146	4⅞	111	⅞	115	8 x 27	
1000	X41K1	8.70	7⅞	181	6⅜	162	5⅝	137	4⅞	114	5⅝	135	⅞	115	8 x 17	
1500	X41.5K1	13.04	7½	191	6¾	171	5⅞	144	4⅞	113	6⅞	154	⅞	115	7 x 14	
2000	X42K1	17.39	8¼	210	6¾	171	5⅞	144	5¼	133	6⅞	154	⅞	115	7 x 14	
3000	X43K1	26.09	8⅞	217	9	229	7½	191	5¾	147	7½	191	⅞	115	11 x 19	
5000	X45K1	43.48	10½	267	9	229	10⅞	259	6½	165	6½	165	⅞	115	11 x 19	



T41K1

## Covers

Description	Catalog number
Terminal covers	TPTC-1001
Primary fuse covers	TPTC-2006

Ⓢ Primary & secondary fuse block provided as standard (750VA unit, only).

Ⓢ Whenever both secondary voltages are to be used at the same time, remove the secondary fuse clip and use a separate mounted 2 pole fuse block.

## Technical data

### UL Overcurrent protection Primary & secondary

Overcurrent protection on both the primary and secondary sides of transformers are specified in UL508 and the National Electrical Code. The maximum acceptable ratings are shown below. Due to the high inrush currents present when a transformer is initially energized, it is recommended that the primary fuse be time delay, to prevent nuisance trips during startup.

#### Maximum acceptable rating of primary overcurrent protection

Primary voltage	VA Rating										
	25	50	75	100	150	200	250	300	350	500	750
115	6/10 (1)	1-1/4 (2)	1-8/10 (3-2/10)	2-1/2 (4)	3-1/2 (6-1/4)	5 (8)	5	6-1/4 (6-1/4)	7-1/2	10	15
120	6/10 (1)	1-1/4 (2)	1-8/10 (3)	2-1/4 (4)	3-1/2 (6-1/4)	5 (8)	5	6-1/4 (6-1/4)	7	10	15
200	3/10 (6/10)	3/4 (1-1/4)	1-1/8 (1-8/10)	1-1/2 (2-1/2)	2-1/4 (3-1/2)	3 (5)	3-1/2 (6-1/4)	4-1/2 (7-1/2)	5 (8)	6-1/4	9
208	3/10 (6/10)	6/10 (1-1/8)	1 (1-8/10)	1-4/10 (2-1/4)	2 (3-1/2)	2-8/10 (4-1/2)	3-1/2 (6)	4 (7)	5 (8)	6	9
220	3/10 (1/2)	6/10 (1-1/8)	1 (1-6/10)	1-1/4 (2-1/4)	2 (3-2/10)	2-1/2 (4-1/2)	3-2/10 (5-6/10)	4 (6-1/4)	4-1/2 (7-1/2)	5-6/10	8
230	3/10 (1/2)	6/10 (1)	8/10 (1-6/10)	1-1/4 (2)	1-8/10 (3-2/10)	2-1/2 (4)	3-2/10 (5)	3-1/2 (6-1/4)	4-1/2 (7-1/2)	5	8
240	3/10 (1/2)	6/10 (1)	8/10 (1-1/2)	1-1/4 (2)	1-8/10 (3)	2-1/4 (4)	3 (5)	3-1/2 (6-1/4)	4 (7)	5	7-1/2
277	1/4 (4/10)	1/2 (8/10)	8/10 (1-1/4)	1 (1-8/10)	1-6/10 (2-1/2)	2 (3-1/2)	2-1/2 (4-1/2)	3-2/10 (5)	3-1/2 (6-1/4)	5 (9)	6-1/4
380	3/16 (3/10)	3/10 (6/10)	1/2 (8/10)	3/4 (1-1/4)	1-1/8 (1-8/10)	1-1/2 (2-1/2)	1-8/10 (3-2/10)	2-1/4 (3-1/2)	2-1/2 (4-1/2)	3-1/2 (6-1/4)	5-6/10 (9)
400	3/16 (3/10)	3/10 (6/10)	1/2 (8/10)	3/4 (1-1/4)	1-1/8 (1-8/10)	1-1/2 (2-1/2)	1-8/10 (3)	2-1/4 (3-1/2)	2-1/2 (4)	3-1/2 (6-1/4)	5-6/10 (9)
415	15/100 (3/10)	3/10 (6/10)	1/2 (8/10)	6/10 (1-1/8)	1 (1-8/10)	1-4/10 (2-1/4)	1-8/10 (3)	2 (3-1/2)	2-1/2 (4)	3-1/2 (6)	5 (9)
440	15/100 (1/4)	3/10 (1/2)	1/2 (8/10)	6/10 (1-1/8)	1 (1-6/10)	1-1/4 (2-1/4)	1-6/10 (2-8/10)	2 (3-2/10)	2-1/4 (3-1/2)	3-2/10 (5-6/10)	5 (8)
460	15/100 (1/4)	3/10 (1/2)	4/10 (8/10)	6/10 (1)	8/10 (1-6/10)	1-1/4 (2)	1-6/10 (2-1/2)	1-8/10 (3-2/10)	2-1/4 (3-1/2)	3-2/10 (5)	4-1/2 (8)
480	15/100 (1/4)	3/10 (1/2)	4/10 (3/4)	6/10 (1)	8/10 (1-1/2)	1-1/4 (2)	1-1/2 (2-1/2)	1-8/10 (3)	2 (3-1/2)	3 (5)	4-1/2 (7-1/2)
550	1/8 (2/10)	1/4 (4/10)	4/10 (6/10)	1/2 (8/10)	8/10 (1-1/4)	1 (1-8/10)	1-1/4 (2-1/4)	1-6/10 (2-1/2)	1-8/10 (3)	2-1/2 (4-1/2)	4 (6-1/4)
575	1/8 (2/10)	1/4 (4/10)	3/10 (6/10)	1/2 (8/10)	3/4 (1-1/4)	1 (1-6/10)	1-1/4 (2)	1-1/2 (2-1/2)	1-8/10 (3)	2-1/2 (4)	3-1/2 (6-1/4)
600	1/8 (2/10)	2/10 (4/10)	3/10 (6/10)	1/2 (8/10)	3/4 (1-1/4)	8/10 (1-6/10)	1-1/4 (2)	1-1/2 (2-1/2)	1-6/10 (2-8/10)	2-1/4 (4)	3-1/2 (6-1/4)

If the rated primary current is less than 2 amps, the maximum rating of the overcurrent device is 300% for power circuits, shown above, or 500% for control circuits, shown above in (brackets). If the rated primary current is 2 amps or more, the maximum rating of the overcurrent device is 250%.

All figures assume secondary overcurrent protection per UL/NEC.

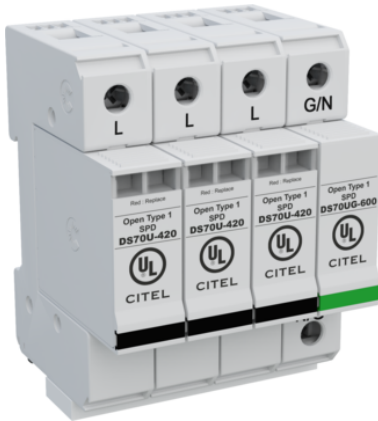
Reference: NEC 430 - 72(c) exception #2, 450-3(b) 1 & 2, UL508 32.7, UL845 11.16 & 11.17.

#### Maximum acceptable rating of secondary overcurrent protection

Secondary voltage	VA Rating										
	25	50	75	100	150	200	250	300	350	500	750
23	1-8/10	3-1/2	5	7	10	12	15	20	20	30	45
24	1-6/10	3-2/10	5	6-1/4	10	12	15	20	20	30	40
25	1-6/10	3-2/10	5	6-1/4	10	12	15	15	20	25	40
90	4/10	8/10	1-1/4	1-8/10	2-1/2	3-1/2	4-1/2	5	6-1/4	9	12
95	4/10	8/10	1-1/4	1-6/10	2-1/2	3-1/2	4	5	6	8	12
100	4/10	8/10	1-1/4	1-6/10	2-1/2	3-2/10	4	5	5-6/10	8	12
110	3/10	3/4	1-1/8	1-1/2	2-1/4	3	3-1/2	4-1/2	5	7-1/2	10
115	3/10	6/10	1	1-4/10	2	2-8/10	3-1/2	4	5	7	10
120	3/10	6/10	1	1-1/4	2	2-1/2	3-2/10	4	4-1/2	6-1/4	10
220	15/100	3/10	1/2	3/4	1-1/8	1-1/2	1-8/10	2-1/4	2-1/2	3-1/2	5-6/10
230	15/100	3/10	1/2	6/10	1	1-4/10	1-8/10	2	2-1/2	3-1/2	5
240	15/100	3/10	1/2	6/10	1	1-1/4	1-6/10	2	2-1/4	3-2/10	5

If the rated secondary current is less than 9 amps, the maximum rating of the overcurrent device is 167%; 9 amps or more, the maximum rating of the overcurrent device is 125%. If 125% does not correspond to a standard fuse rating, the next highest standard rating may be used.

Reference: NEC 430 - 72(c) exception #2, 450-3(b) 1 & 2, UL508 32.7, UL845 11.16 & 11.17.



- Multi-MOV Technology
- UL1449 Type 1 LISTED
- 75kA Surge Current Rating per module
- Visual fault indicator and remote contacts
- 10-Year warranty

#### Electrical Characteristics

POWER SPD TYPE		UL1449 TYPE 1 LISTED
VOLTS	(V)	480/277
AC/DC/DC PV/RF		AC
PHASE	(PH)	3Y
AMPS	(A)	n/a
AMBIENT MIN	(C)	-35
AMBIENT MAX	(C)	+85
MODES		L-L, L-N, L-G, N-G
VPR	(V)	2500/1500/1500/1200
MCOV	(V)	840/420/420/320
IN(15 impulses 8/20 $\mu$ s)	(kA)	20
SCCR	(kA)	200
IMAX(8/20 $\mu$ s)	(kA)	75

#### Mechanical Characteristics

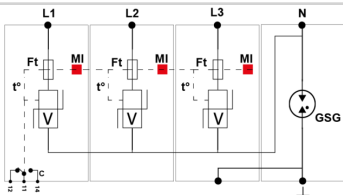
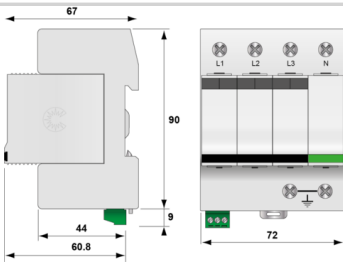
TECHNOLOGY		Multi-MOV+GSG
NETWORK CONFIGURATION		3PH, 4W+G, Wye
CONNECTION METHOD		Screw Terminal (8-12AWG)
MOUNTING		DIN RAIL
MATERIAL		Thermoplastic UL94-V0
NEMA RATING (IP RATING)		NEMA 2 (IP20)
FAIL-SAFE BEHAVIOR		Disconnection via fuse-link
REAL-TIME DIAGNOSTICS		Visual indicator and remote contacts
DIMENSIONS		See diagram (mm)

#### Standards

UL STANDARD		UL1449 4th Edition
UL CATEGORY		VZCA, VZCA7
UL FILE NUMBER		E326289
STANDARDS		NOM-003-SCFI-2014, NOM-001-SCFI-1993
ENVIRONMENTAL STANDARDS		ROHS

#### Part number

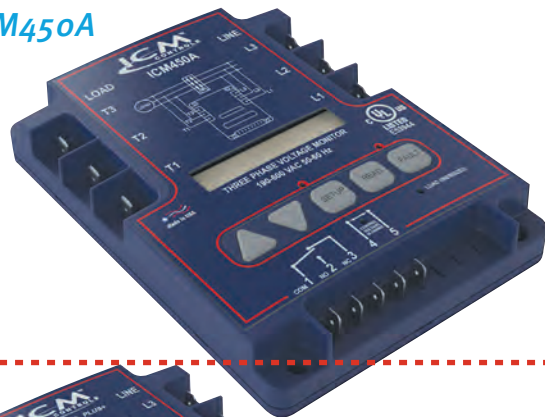
32143455



V: High-energy varistor  
 Ft: Thermal fuse  
 C: Remote signal contact  
 t°: Thermal disconnection system  
 MI: Disconnection indicator

**APPLICATIONS:**

APPLIANCE | ELECTRICAL | HVAC/R | MARINE | POOL &amp; SPA | RV

**ICM450A**

**ICM450A PLUS+**


## Stop Motor Burnouts!

For more than two decades, ICM has been an innovator and a recognized leader in the manufacturer of line voltage controls designed to protect your most valuable equipment. The **ICM450A** and **ICM450A PLUS+** are the latest 3-phase offerings, providing superior motor protection from premature failure and damage caused by common voltage faults such as phase unbalance, over/under voltage, phase loss and phase reversal.

A design upgrade from our flagship **ICM450**, these newest models feature an easy to read, backlit display that makes quick work of adjusting the variable settings to better tailor the unit to the application. Common 1/4" spade terminations eliminate the potential for exposed wires and allow for a better and safer connection. Both models also include menu options for English and Spanish readouts.

Additionally, the **ICM450A PLUS+** offers a real time clock for date and time stamp of fault events when they occur along with a Modbus RS485 communications port for communicating with a standard building management system.

Both the **ICM450A** and **ICM450A PLUS+** are proudly manufactured in the USA by ICM Controls.

## FEATURES

	ICM450A	ICM450A PLUS+
✓ Backlit LCD	•	•
✓ Simultaneous 3-phase true RMS voltage monitoring	•	•
✓ Factory calibrated	•	•
✓ 3-phase voltages simultaneously displayed on LCD	•	•
✓ Fault memory	•	•
✓ Fault monitoring: High / low voltage, voltage unbalance, phase loss, phase reversal	•	•
✓ Real time clock, date and time stamped events		•
✓ Simple configuration	•	•
✓ Fully adjustable variables	•	•
✓ Modbus RS485 communications		•
✓ LED indicators	•	•
✓ Common 1/4" quick connect terminations	•	•
✓ English or Spanish menu options	•	•

## SPECIFICATIONS

### INPUT:

- **Line Voltage:** Universal, 190-600 VAC
- **Frequency:** 50-60 Hz
- **Load Side Monitoring:** Optional
- **Control Voltage:** 18-240 VAC

### OUTPUT:

- **Type:** Relay, SPDT
- **Voltage Range:** 277 VAC @ 6A maximum

### CONTROL OPERATING TEMPERATURE

- **Operating Temperature:** -40°F to +149°F (-40°C to +65°C)
- **Storage Temperature:** -40°F to +185°F (-40°C to +85°C)

### MECHANICAL:

- **Mounting:** Surface mount using (2) #8 screws
- **Terminations:** 1/4" quick connects
- **Weight:** 12 ounces (341 grams)
- **ModBus:** RS485 Communication (**ICM450A plus+**)
- **Dimensions:** 6.5" x 4.75" x 1.09"

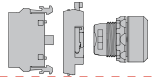
### ORDERING INFORMATION:

- **ICM450A:** Supersedes ICM450
- **ICM450A PLUS+:** Supersedes ICM450, ICM455

## REPLACES

- |   |                          |                              |
|---|--------------------------|------------------------------|
| ■ <b>A-1:</b> EAC-800, EAC-8000, EAC-8002     | ■ <b>Mars:</b> PFM-2000  | ■ <b>Time Mark:</b> 265      |
| ■ <b>Copeland:</b> 085-0160-00                | ■ <b>Motorsaver:</b> 455 | ■ <b>Wagner/DiversiTech:</b> |
| ■ <b>Diversified:</b> AC-2020, AC-301, AC-302 | ■ <b>SSAC:</b> QLM, QLV  | DTP-3, WPC-800               |

Modular Range



Potentiometer

**Operator: Potentiometer**

Description	Type	Order Code	Package Quantity	Weight Kg
<b>Complete Potentiometers</b>				
Black knob with integrated position indication and marking in white				
<b>With Resistor 5 kohm</b>				
Black Plastic Bezel	MT-105B	1SFA 611 410 R1056	1	0.040
Chrome Metal Bezel	MT-305B	1SFA 611 410 R3056	1	0.048
<b>With Resistor 10 kohm</b>				
Black Plastic Bezel	MT-110B	1SFA 611 410 R1106	1	0.040
Chrome Metal Bezel	MT-310B	1SFA 611 410 R3106	1	0.048
<b>With Resistor 50 kohm</b>				
Black Plastic Bezel	MT-150B	1SFA 611 410 R1506	1	0.040
Chrome Metal Bezel	MT-350B	1SFA 611 410 R3506	1	0.048

**Knob without Resistor**

Black knob with integrated position indication and marking in white.

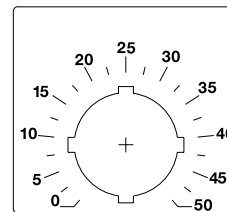
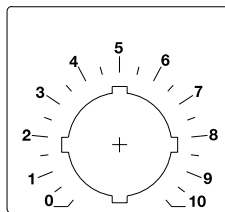
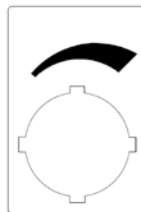
For shaft diameter 6 -6.35 mm.

Min. shaft length 20 mm.

Black Plastic Bezel	KT-100B	1SFA 616 410 R1006	10	0.034
Chrome Metal Bezel	KT-300B	1SFA 616 410 R3006	10	0.042

**Legend Plates Aluminum**

Symbol: see fig. (29.6 x 44.5 mm)	-	SK 615 562-87	10	0.002
Scale: 0-10 (48.5 x 44.5 mm)	-	SK 615 562-88	10	0.002
Scale: 0-50 (48.5 x 44.5 mm)	-	1SFA 611 930 R1252	10	0.002

**Legend Plates**

## Buzzers



Buzzer

**Operator: Buzzer**

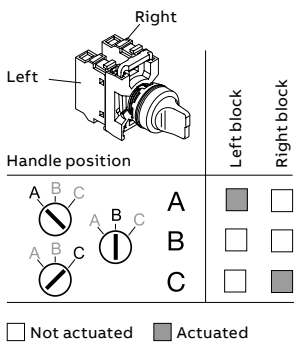
Description	Type	Order Code	Package Quantity	Weight Kg
<b>Buzzers</b>				
Black. Frequency: Approx. 2400 Hz. Loudness: Min 80 dB (A)/10 cm Rated Current: < 8 mA. Service Life:>5000 h Suitable for both 50 and 60 Hz networks				
<b>Supply Voltage : Tone Type</b>				
24 V AC/DC	Continuous	KB1-4010	1SFA 616 401 R4010	1x10
115 V AC/DC	Continuous	KB1-4030	1SFA 616 401 R4030	1x10
230 V AC	Continuous	KB1-4040	1SFA 616 401 R4040	1x10
24 V AC/DC	Pulsating	KB1-4110	1SFA 616 401 R4110	1x10
115 V AC/DC	Pulsating	KB1-4130	1SFA 616 401 R4130	1x10
230 V AC	Pulsating	KB1-4140	1SFA 616 401 R4140	1x10

**Modular plastic range**

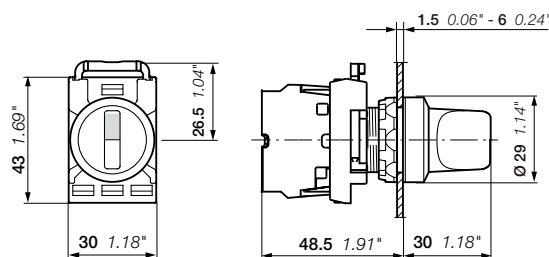
**Illuminated selector switches - 3-position - Short handle**



**Contacts actuated**

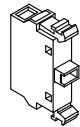
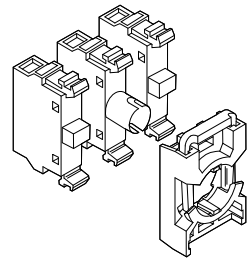
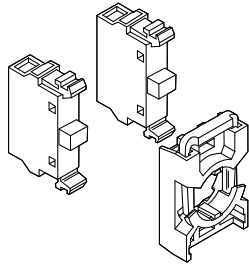


Operating principle	Color	Bezel	Type	Order code	Pkg qty	Weight (1 pce) kg	
	● Red	Black plastic	M3SS1-11R	1SFA611210R1101	1	0.015	
		Chrome plastic	M3SS1-21R	1SFA611210R2101	1	0.015	
		Chrome metal	M3SS1-31R	1SFA611210R3101	1	0.024	
	● Green	Black plastic	M3SS1-11G	1SFA611210R1102	1	0.015	
		Chrome plastic	M3SS1-21G	1SFA611210R2102	1	0.015	
		Chrome metal	M3SS1-31G	1SFA611210R3102	1	0.024	
	● Yellow	Black plastic	M3SS1-11Y	1SFA611210R1103	1	0.015	
		Chrome plastic	M3SS1-21Y	1SFA611210R2103	1	0.015	
		Chrome metal	M3SS1-31Y	1SFA611210R3103	1	0.024	
	● Blue	Black plastic	M3SS1-11L	1SFA611210R1104	1	0.015	
		Chrome plastic	M3SS1-21L	1SFA611210R2104	1	0.015	
		Chrome metal	M3SS1-31L	1SFA611210R3104	1	0.024	
○ Clear	Black plastic	M3SS1-11C	1SFA611210R1108	1	0.015		
	Chrome plastic	M3SS1-21C	1SFA611210R2108	1	0.015		
	Chrome metal	M3SS1-31C	1SFA611210R3108	1	0.024		
	● Red	Black plastic	M3SS2-11R	1SFA611211R1101	1	0.015	
		Chrome plastic	M3SS2-21R	1SFA611211R2101	1	0.015	
		Chrome metal	M3SS2-31R	1SFA611211R3101	1	0.024	
	● Green	Black plastic	M3SS2-11G	1SFA611211R1102	1	0.015	
		Chrome plastic	M3SS2-21G	1SFA611211R2102	1	0.015	
		Chrome metal	M3SS2-31G	1SFA611211R3102	1	0.024	
	● Yellow	Black plastic	M3SS2-11Y	1SFA611211R1103	1	0.015	
		Chrome plastic	M3SS2-21Y	1SFA611211R2103	1	0.015	
		Chrome metal	M3SS2-31Y	1SFA611211R3104	1	0.024	
	● Blue	Black plastic	M3SS2-11L	1SFA611211R1104	1	0.015	
		Chrome plastic	M3SS2-21L	1SFA611211R2104	1	0.015	
		Chrome metal	M3SS2-31L	1SFA611211R3104	1	0.024	
○ Clear	Black plastic	M3SS2-11C	1SFA611211R1108	1	0.015		
	Chrome plastic	M3SS2-21C	1SFA611211R2108	1	0.015		
	Chrome metal	M3SS2-31C	1SFA611211R3108	1	0.024		
	● Red	Black plastic	M3SS3-11R	1SFA611212R1101	1	0.015	
		Chrome plastic	M3SS3-21R	1SFA611212R2101	1	0.015	
	● Green	Black plastic	M3SS3-11G	1SFA611212R1102	1	0.015	
		Chrome plastic	M3SS3-21G	1SFA611212R2102	1	0.015	
	● Yellow	Black plastic	M3SS3-11Y	1SFA611212R1103	1	0.015	
		Chrome plastic	M3SS3-21Y	1SFA611212R2103	1	0.015	
● Blue	Black plastic	M3SS3-11L	1SFA611212R1104	1	0.015		
	Chrome plastic	M3SS3-21L	1SFA611212R2104	1	0.015		
○ Clear	Black plastic	M3SS3-11C	1SFA611212R1108	1	0.015		
	Chrome metal	M3SS3-31C	1SFA611212R3108	1	0.024		
	● Red	Black plastic	M3SS7-11R	1SFA611216R1101	1	0.015	
		Chrome plastic	M3SS7-21G	1SFA611216R2102	1	0.015	
		Chrome metal	M3SS7-31G	1SFA611216R3102	1	0.024	
	● Yellow	Black plastic	M3SS7-11Y	1SFA611216R1103	1	0.015	
		● Blue	Black plastic	M3SS7-11L	1SFA611216R1104	1	0.015
		Chrome plastic	M3SS7-21L	1SFA611216R2104	1	0.015	
○ Clear	Black plastic	M3SS7-11C	1SFA611216R1108	1	0.015		
	Chrome plastic	M3SS7-21C	1SFA611216R2108	1	0.015		
	Chrome metal	M3SS7-31C	1SFA611216R3108	1	0.024		

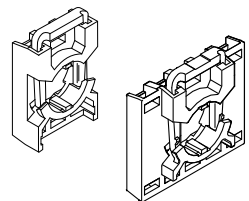
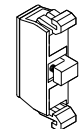
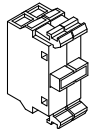


M3SS  
Dimensions (mm, inches)

## CONTACT BLOCKS



NO  $\overline{3}$   $\rightarrow$   $\overline{4}$   
 LB  $\overline{X1}$   $\otimes$   $\overline{X2}$   
 NC  $\overline{1}$   $\rightarrow$   $\overline{2}$



Contact block holders

## Contact blocks and lamp blocks with holder for front mounting

Max. number of blocks in holder	Included blocks	Catalog No.	Ref. Code
<b>For non-illuminated operators</b>			
3	1 NC	<b>MCBH-01</b>	1SFA 611 605 R1110
3	1 NO	<b>MCBH-10</b>	1SFA 611 605 R1101
3	2 NC	<b>MCBH-02</b>	1SFA 611 605 R1120
3	2 NO	<b>MCBH-20</b>	1SFA 611 605 R1102
3	3 NC	<b>MCBH-03</b>	1SFA 611 605 R1130
3	3 NO	<b>MCBH-30</b>	1SFA 611 605 R1103
3	1 NO + 1 NC	<b>MCBH-11</b>	1SFA 611 605 R1111
3	1 NO + 2 NC	<b>MCBH-12</b>	1SFA 611 605 R1121
3	2 NO + 1 NC	<b>MCBH-21</b>	1SFA 611 605 R1112

## For illuminated operators

3	1 LB	<b>MCBH-001</b>	—
3	1 NC + 1 LB	<b>MCBH-011</b>	1SFA 611 605 R1210
3	1 NO + 1 LB	<b>MCBH-101</b>	1SFA 611 605 R1201
3	1 NO + 1 NC + 1 LB	<b>MCBH-111</b>	1SFA 611 605 R1211
3	2 NC + 1 LB	<b>MCBH-021</b>	1SFA 611 605 R1220
3	2 NO + 1 LB	<b>MCBH-201</b>	1SFA 611 605 R1202

## Single contact blocks for front mounting

Contacts	Catalog No.	Ref. Code
1 NO	<b>MCB-10</b>	<b>1SFA 611 610 R1001</b>
1 NC	<b>MCB-01</b>	1SFA 611 610 R1010
1 NO with gold plated contacts	<b>MCB-10G</b>	1SFA 611 610 R1101
1 NC with gold plated contacts	<b>MCB-01G</b>	1SFA 611 610 R1110

## Double contact block for front mounting

To be used together with MCBH5-00 when contact blocks in position 4- and 5- are needed.  
 Also when using MCBH-00 together with selector switch and contact block in position 3- is needed

Included blocks	Catalog No.	Ref. Code
2 NO	<b>MCB-20</b>	1SFA 611 610 R1002
2 NC	<b>MCB-02</b>	1SFA 611 610 R1020
1 NO + 1 NC	<b>MCB-11</b>	1SFA 611 610 R1011

## Micro contact blocks for front mounting

Contacts	Catalog No.	Ref. Code
1 NO	<b>MCBL-10</b>	1SFA611612R1010
1 NC	<b>MCBL-01</b>	1SFA611612R1001

## Holders

Description	Catalog No.	Ref. Code
Holders for front mounting		
For three blocks	<b>MCBH-00</b>	<b>1SFA 611 605 R1100</b>
For five blocks	<b>MCBH5-00</b>	1SFA 611 601 R1100

# Accessories for Modular Range LED Blocks, front mounting

## Section 2.19 LED Blocks



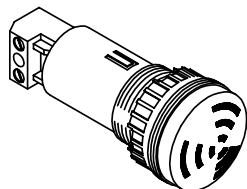
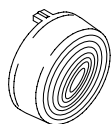
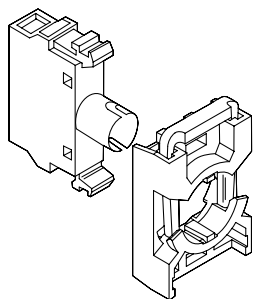
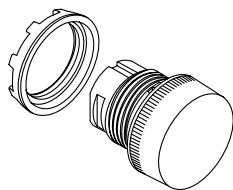
LED Block with built in  
leakage current protection

Description	Rated Current mA	Wavelength nm	Luminance mcd	Catalogue No.	List Price	Weight Kg
<b>LED-blocks</b>						
<b>Rated Voltage 12 V, DC</b>						
● Red	12.0	620	320	MLBL-00R		0.012
● Green	9.3	520	1500	MLBL-00G		0.012
● Yellow	12.0	588	380	MLBL-00Y		0.012
● Blue	9.5	468	450	MLBL-00L		0.012
○ White	9.3	<sup>2)</sup>	600	MLBL-00W		0.012
<b>Rated Voltage 24 V, AC/DC</b>						
● Red	9.9	620	250	MLBL-01R		0.012
● Green	9.2	520	1500	MLBL-01G		0.012
● Yellow	9.9	588	250	MLBL-01Y		0.012
● Blue	9.3	468	450	MLBL-01L		0.012
○ White	9.2	<sup>2)</sup>	600	MLBL-01W		0.012
<b>Rated Voltage 48 V, AC/DC</b>						
● Red	10.0	620	260	MLBL-02R		0.012
● Green	9.7	520	1500	MLBL-02G		0.012
● Yellow	10.0	588	300	MLBL-02Y		0.012
● Blue	9.7	468	450	MLBL-02L		0.012
○ White	9.7	<sup>1)</sup>	600	MLBL-02W		0.012
<b>Rated Voltage 60 V, AC/DC</b>						
● Red	13.0	620	350	MLBL-03R		0.012
● Green	12.7	520	2000	MLBL-03G		0.012
● Yellow	13.0	588	400	MLBL-03Y		0.012
● Blue	12.7	468	550	MLBL-03L		0.012
○ White	12.7	<sup>1)</sup>	750	MLBL-03W		0.012
<b>Rated Voltage 110-130 V, AC</b>						
● Red	8.6	620	200	MLBL-04R		0.012
● Green	8.5	520	1200	MLBL-04G		0.012
● Yellow	8.6	588	250	MLBL-04Y		0.012
● Blue	7.0	468	400	MLBL-04L		0.012
○ White	7.0	<sup>1)</sup>	500	MLBL-04W		0.012
<b>Rated Voltage 110-130 V, DC</b>						
● Red	9.9	620	250	MLBL-05R		0.012
● Green	9.8	520	1500	MLBL-05G		0.012
● Yellow	9.9	588	300	MLBL-05Y		0.012
● Blue	9.8	468	450	MLBL-05L		0.012
○ White	9.8	<sup>1)</sup>	600	MLBL-05W		0.012
<b>Rated Voltage 220 V, DC</b>						
● Red	8.0	620	180	MLBL-06R		0.012
● Green	8.0	520	110	MLBL-06G		0.012
● Yellow	8.0	588	200	MLBL-06Y		0.012
● Blue	8.0	468	450	MLBL-06L		0.012
○ White	8.0	<sup>1)</sup>	600	MLBL-06W		0.012
<b>Rated Voltage 230 V, AC</b>						
● Red	9.5	620	250	MLBL-07R		0.012
● Green	9.4	520	1500	MLBL-07G		0.012
● Yellow	9.5	588	300	MLBL-07Y		0.012
● Blue	8.2	468	450	MLBL-07L		0.012
○ White	8.2	<sup>1)</sup>	600	MLBL-07W		0.012

Note: Care should be taken for DC supply where + and - must be correctly connected. This is marked X1 (+) and X2 (-) on the product.

<sup>1)</sup> X=0.31, Y=0.32 according to the ICI Chromaticity Diagram.

## Pilot lights and Buzzers



## Pilot light head ①②

Lens color	Catalog No.	Ref. Code
Red	ML1-100R	1SFA 611 400 R1001
Green	ML1-100G	1SFA 611 400 R1002
Yellow	ML1-100Y	1SFA 611 400 R1003
Blue	ML1-100L	1SFA 611 400 R1004
White	ML1-100W	1SFA 611 400 R1005
Clear	ML1-100C	1SFA 611 400 R1008

## Lamp blocks with holder ①

Supply voltage	Catalog No.	Ref. Code
<b>For max. 2 W, 230 V AC and DC filament bulb or LED</b> $\begin{array}{c} 230 \text{ V, } 2 \text{ W} \\ \text{X1} \text{---} \text{X2} \end{array}$ 115 V AC supply voltage. <b>For 60 V filament bulb max. 1.2 W</b> $\begin{array}{c} 115 \text{ V} \\ \text{X1} \text{---} \text{X2} \\ \text{60 V} \\ \text{1.2 W} \end{array}$ 230 V AC supply voltage. <b>For 130 V filament bulb max. 2 W</b> $\begin{array}{c} 230 \text{ V} \\ \text{X1} \text{---} \text{X2} \\ \text{130 V} \\ \text{2 W} \end{array}$	MCBH-001	1SFA 611 605 R1200
	MCBH-002	1SFA 611 605 R1300
	MCBH-003	1SFA 611 605 R1400

## Light diffusing lens

To improve illumination. *Note: Cannot be used with text cap.*

Description	Catalog No.	Ref. Code
The lens is used instead of text cap.	KA1-8005	1SFA 616 920 R8005

## Buzzers

Black. Frequency: Approx. 2400 Hz. Loudness: Min 80 dB (A)/10 cm  
 Rated current:  $\leq 8$  mA. Service life: >5000 h

Supply voltage	Tone	Catalog No.	Catalog No.	Ref. Code
24 V AC/DC	Continuous	KB1-4010		1SFA 616 401 R4010
115 V AC/DC	Continuous	KB1-4030		1SFA 616 401 R4030
230 V AC	Continuous	KB1-4040		1SFA 616 401 R4040
24 V AC/DC	Pulsating	KB1-4110		1SFA 616 401 R4110
115 V AC/DC	Pulsating	KB1-4130		1SFA 616 401 R4130
230 V AC	Pulsating	KB1-4140		1SFA 616 401 R4140

① Bulb not included. See page 8.23

② For compact style, see page 8.33.



Your Enclosure Source®

### Part Information - SCE-724818FSD

#### ■ SCE-724818FSD

##### Application -

Designed to house a variety of electrical and electronic controls and instruments. Provisions for optional surface mounting or rack mounting of almost any type of equipment. Provides protection from dust, dirt, water and oil. For outdoor application a drip shield and drain holes are required. The enclosures are extra deep for applications requiring more interior space.

##### Construction -

- 0.104" carbon steel.
- Removable and interchangeable doors.
- Concealed hinge.
- Seams continuously welded and ground smooth, no holes or knockouts.
- Strong, rigid construction with stiffeners welded on backs of single access boxes.
- Lifting eyes for easy handling.
- Black zinc die cast keylocking/padlocking handle.
- 3-point latching mechanism.
- Latch rods have ramp shoes for easier door closing.
- Flange trough collar around all sides of door opening.
- Removable print pocket provided on door.
- Mounting channels welded horizontally on sides of interior body at top, bottom and middle for mounting optional panels or rack mounting angles.
- Oil resistant gasket.
- Ground stud on door.
- Provisions for fluorescent light kit.

##### Finish -

ANSI-61 gray finish inside and out. Optional sub-panels are powder coated white.

##### Industry Standards - (IS3)

NEMA Type 3R, 12 and Type 13  
UL Listed Type 3R and 12  
CSA Type 3R and 12  
IEC 60529 IP 55

##### Notes -

Special Instructions apply for IS3, IS4 and IS6 to maintain the environmental rating of Type 3R for these parts. Instructions are located on the enclosure door. Drip shield is required on IS3, drip shield is recommended on IS4 and IS6. Drain holes are required on all.

##### Product Specifications -

Part Number: SCE-724818FSD  
Description: FSD Enclosure  
Height: 72.00"  
Width: 48.00"  
Depth: 18.00"  
Price Code: A2  
Catalog Page: 110  
Est. Ship Weight: 450.00 lbs



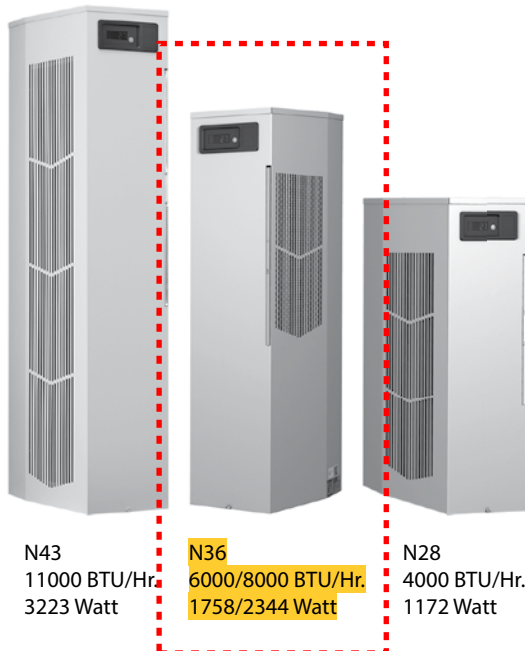
##### Optional Accessories -

- SCE-13ELJEXPP - Pocket, Exterior Print
- SCE-14RMW - Wireway, Removable
- SCE-19ELJEXPP - Pocket, Exterior Print
- SCE-60P24F1 - Subpanel, Full  
\*\*Requires heavy duty panel support & center panel support (SCE-72FSDPS & SCE-72FSCPS)
- SCE-60P24F2 - Subpanel, Half  
\*\*Requires heavy duty panel supports & center panel support (SCE-72FSDPS & SCE-72FSCPS)
- SCE-60P48F1 - Subpanel, Full  
\*\*Requires heavy duty panel supports (SCE-72FSDPS)
- SCE-60RA19TH - Angle, Rack  
\*\*Requires center panel support (SCE-72FSCPS)
- SCE-60RP24F5 - Angle, Rack  
\*\*Requires center panel support (SCE-72FSCPS)
- SCE-72FSCPS - Support, Center Panel
- SCE-72FSCS - Support, Center
- SCE-72FSDPS - Panel Support Heavy Duty  
\*\*Requires center panel support (SCE-72FSCPS)
- SCE-72P24F1 - Subpanel, Full  
\*\*Requires center panel support (SCE-72FSCPS)
- SCE-72P24F2 - Subpanel, Half  
\*\*Requires center panel support (SCE-72FSCPS)
- SCE-72P48F1 - Subpanel, Full
- SCE-72P48F2 - Subpanel, Half
- SCE-72RA19TH - Angle, Rack  
\*\*Requires center panel support (SCE-72FSCPS)
- SCE-72RP24F5 - Angle, Rack  
\*\*Requires center panel support (SCE-72FSCPS)
- SCE-72RP24F6 - Angle, Rack  
\*\*Requires center panel support (SCE-72FSCPS)
- SCE-72SMP14 - Subpanel, Side Mount  
\*\*Cannot be used when other panels are installed.
- SCE-72SP24F3 - Panel, Swingout Full  
\*\*Requires center panel support (SCE-72FSCPS)
- SCE-72SP24F4 - Panel, Swingout Half  
\*\*Requires center panel support (SCE-72FSCPS)
- SCE-90P24F2 - Subpanel, Half  
\*\*Requires heavy duty panel supports & center panel support (SCE-72FSDPS & SCE-72FSCPS)
- SCE-90P48F2 - Subpanel, Half  
\*\*Requires heavy duty panel supports (SCE-72FSDPS)
- SCE-90RP24F6 - Angle, Rack  
\*\*Requires center panel support (SCE-72FSCPS)



SEALED ENCLOSURE COOLING AIR CONDITIONERS

### SPECTRACOOL NARROW INDOOR/OUTDOOR



#### INDUSTRY STANDARDS

UL/cUL Listed; Type 12, 3R, 4; 4X optional; File No. SA6453

#### CE

IP 56 Internal Loop

IP 34 on External Loop

Telcordia GR-487 capable (Outdoor)

#### APPLICATION

- Industrial automation
- Waste water treatment systems
- Package handling equipment
- Security and defense systems

#### FEATURES

- Narrow design accommodates 12-in. (300-mm) deep cabinets
- Energy efficient reciprocating compressor on N28 models
- Energy efficient rotary compressor on N36 and N43 models
- R407c and R134a earth-friendly refrigerants
- Models for 115, 230 and 400/460 3-phase VAC power input
- UL Listed to save customers time and money with agency approvals
- Outdoor model operating temperature range from -40 F/-40 C to 131 F/55 C (125 F/52 C on N28 Series)
- Attractive industrial design with minimal use of visible fasteners
- Reliable mechanical thermostat on enclosure side of the unit; indoor Air Conditioner models include digital display on ambient side
- Galvanized sheet-metal cover for rugged factory and outdoor environments
- Easy-mount flanges for simple installation
- Cut-out adapter options for enclosures with GENESIS® air conditioners enable users to easily transition to the new unit
- Dust-resistant condenser coil allows the unit to be run filterless in most applications
- Cleanable, reusable aluminum mesh filter protects coils for maximum cooling performance
- Mounting hardware, gaskets and user manual furnished with the unit
- Every unit functionally tested before shipping
- Standard Indoor Air Conditioner models also include:
  - Active condensate management with heater strip
  - Power-off relay for door switch and other system requirements
  - Malfunction switch
- Standard Outdoor Air Conditioner models also include:
  - Telcordia GR-487 capable
  - Corrosion-resistant components
  - Malfunction switch
  - Compressor heater
  - Head pressure control
  - 1300 W enclosure heater

#### SPECIFICATIONS

- Nominal cooling capacity:
  - N28 4000 BTU/Hr. (1172 W)
  - N36 6000 & 8000 BTU/Hr. (1758 and 2344 W)
  - N43 11000 BTU/Hr. (3223 W)
- Outdoor model operating temperature range from -40 F/-40 C to 131 F/55 C (125 F/52 C on N28 Series)

#### FINISH

- RAL 7035 light-gray, semi-textured powder-coat paint
- Other colors and textures available

Performance Data **N36 6000/8000 BTU/Hr. (1758/2344 Watt)****CATALOG NUMBER**

Indoor Model	N360616G050	N360626G050	N360646G050	N360816G050	N360826G050	N360846G050
Indoor Model Stainless Steel Type 4X	N360616G051	N360626G051	N360646G051	N360816G051	N360826G051	N360846G051
Indoor Model with Remote Access Control*	N360616G060	N360626G060	N360646G060	N360816G060	N360826G060	N360846G060
<b>Outdoor Model without Heat Pkg.</b>	<b>N360616G100</b>	<b>N360626G100</b>	<b>N360646G100</b>	<b>N360816G100</b>	<b>N360826G100</b>	<b>N360846G100</b>
Outdoor Model without Heat Pkg. Stainless Steel Type 4X	N360616G102	N360626G102	N360646G102	N360816G102	N360826G102	N360846G102
Outdoor Model with Heat Pkg.	N360616G150	N360626G150	N360646G150	N360816G150	N360826G150	N360846G150
Outdoor Model with Heat Pkg. Stainless Steel Type 4X	N360616G151	N360626G151	N360646G151	N360816G151	N360826G151	N360846G151

**COOLING PERFORMANCE****Nominal:**

<b>BTU/Hr.</b>	<b>5400 / 6000</b>	<b>5400 / 6000</b>	<b>5400 / 6000</b>	<b>8250 / 8500</b>	<b>8250 / 8500</b>	<b>8250 / 8500</b>
<b>Watts</b>	<b>1581 / 1757</b>	<b>1581 / 1757</b>	<b>1581 / 1757</b>	<b>2416 / 2489</b>	<b>2313 / 2635</b>	<b>2284 / 2401</b>
At 131 F / 131 F (55 C / 55 C):						
BTU/Hr. (50 / 60 Hz)	5585 / 6180	5469 / 5965	5300 / 6089	8213 / 8453	7874 / 8063	7777 / 8166
Watts (50 / 60 Hz)	1637 / 1811	1603 / 1748	1553 / 1785	2405 / 2475	2306 / 2361	2277 / 2391
At 95 F / 95 F (35 C / 35 C):						
BTU/Hr. (50 / 60 Hz)	4909 / 5485	5159 / 5621	5572 / 6026	7028 / 7626	6660 / 7411	6877 / 7525
Watts (50 / 60 Hz)	1439 / 1607	1512 / 1647	1633 / 1766	2058 / 2233	1950 / 2170	2014 / 2203
Refrigerant	R134a	R134a	R134a	R134a	R134a	R134a
Refrigerant Charge (ounces/grams)	20 / 567	22 / 624	16 / 454	36 / 1021	36 / 1021	36 / 1021
Operating Temperature Range:						
Maximum (°F / °C)	131 / 55	131 / 55	131 / 55	131 / 55	131 / 55	131 / 55
Minimum (°F / °C)	-40 / -40	-40 / -40	-40 / -40	-40 / -40	-40 / -40	-40 / -40
Air Flow at 0 Static Pressure:						
Internal loop 50 Hz (CFM / M <sup>3</sup> /Hr.)	251 / 426	250 / 425	250 / 425	250 / 425	245 / 416	243 / 413
External loop 50 Hz (CFM / M <sup>3</sup> /Hr.)	284 / 483	338 / 574	338 / 574	313 / 532	347 / 589	365 / 620
Internal loop 60 Hz (CFM / M <sup>3</sup> /Hr.)	261 / 443	261 / 443	261 / 443	263 / 447	258 / 439	254 / 432
External loop 60 Hz (CFM / M <sup>3</sup> /Hr.)	311 / 528	356 / 605	356 / 605	338 / 574	382 / 648	394 / 669
Max. Heater W (Outdoor Models)	1300	1300	1300	1300	1300	1300

**ELECTRICAL DATA**

<b>Rated Voltage</b>	<b>115</b>	<b>230</b>	<b>400 / 460 3~</b>	<b>115</b>	<b>230</b>	<b>400 / 460 3~</b>
Frequency (Hz)	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60
Operating Range	+/-10%	+/-10%	+/-10%	+/-10%	+/-10%	+/-10%
Max. Power Consumption (Watts at 50 / 60 Hz)	911 / 1108	908 / 1073	697 / 895	1334 / 1530	1265 / 1403	572 / 628
Max. Nominal Current (Amps at 50 / 60 Hz)	9.1 / 10.1	4.5 / 4.7	1.59 / 1.69	11.6 / 13.3	5.5/6.1	2.9/3.0
Starting Current (Amps)	39.2	23	8.1	48.3	27	16

## Agency Approvals

cUL Listed

CE

Others available upon request

Terminal Block

## Power Input Description

**ENCLOSURE PROTECTION**

## UL Type

Type 12, 3R, 4 Standard

Type 4X Stainless Steel Optional

**CONTROLLER**

## Description

Basic Mechanical Thermostat

## Thermostat Location

Enclosure Side

## Factory Thermostat Setting (°F / °C)

80 / 27

**SOUND LEVEL**

At 1.5 Meters	66.9 dBA	66.7 dBA	68.2 dBA	66.0 dBA	66.0 dBA	66.0 dBA
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**UNIT CONSTRUCTION**

## Material

Galvanized sheet metal standard

Stainless steel optional

## Finish

RAL 7035 light-gray, semi-textured powder-coat paint standard

Other colors available

**ACCESSORIES**

## EASYSWAP Adaptor Plenum (GENESIS M36)

Enables SPECTRACOOL to be mounted to a GENESIS M36 air conditioner cutout

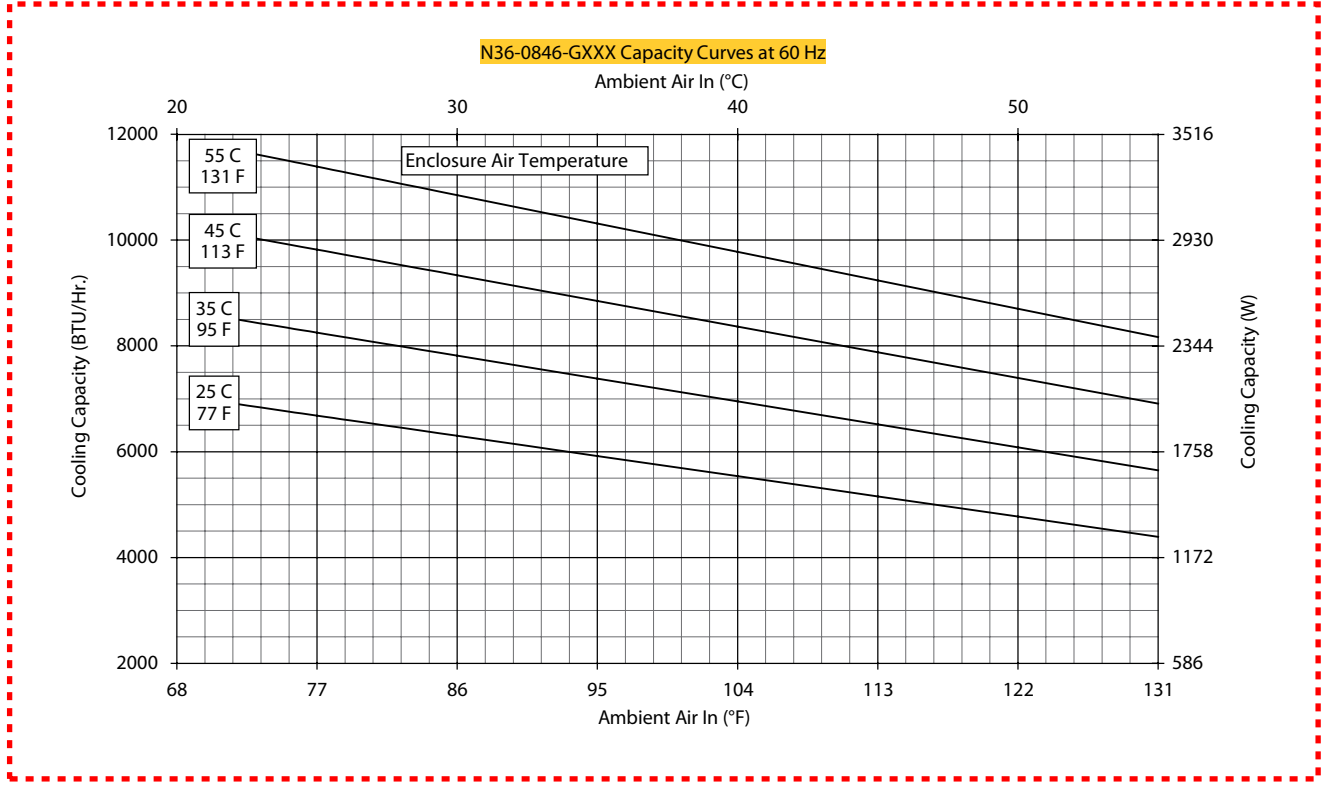
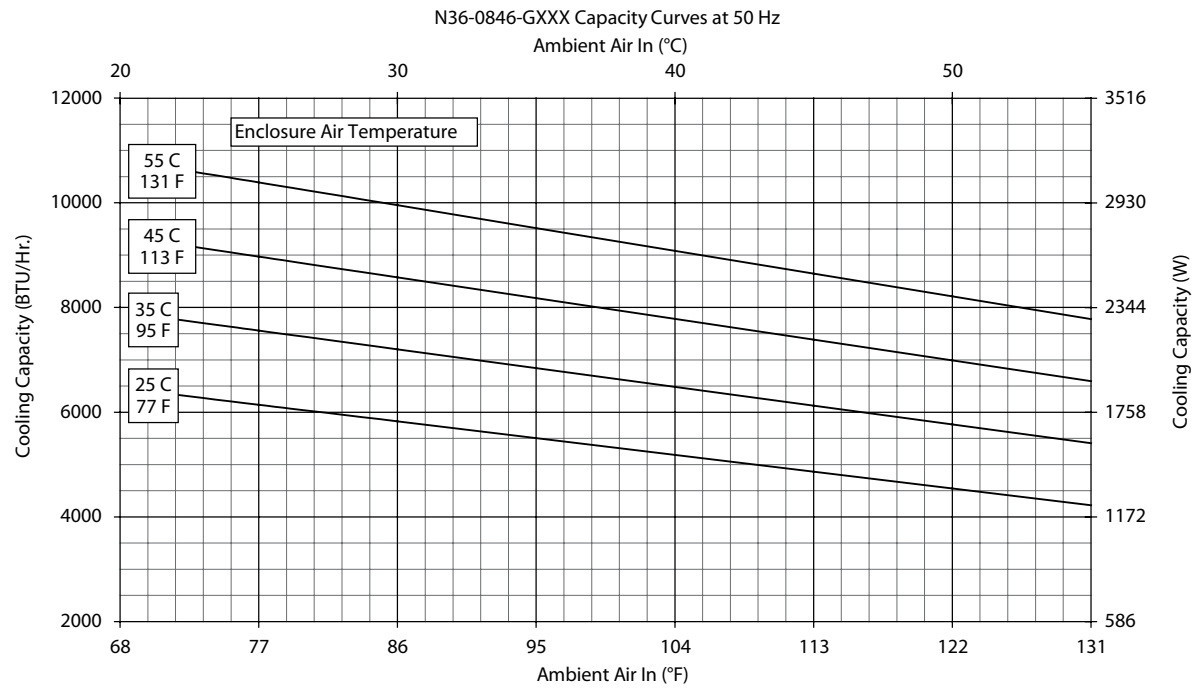
Catalog Number PLM36N36

**UNIT DIMENSIONS**

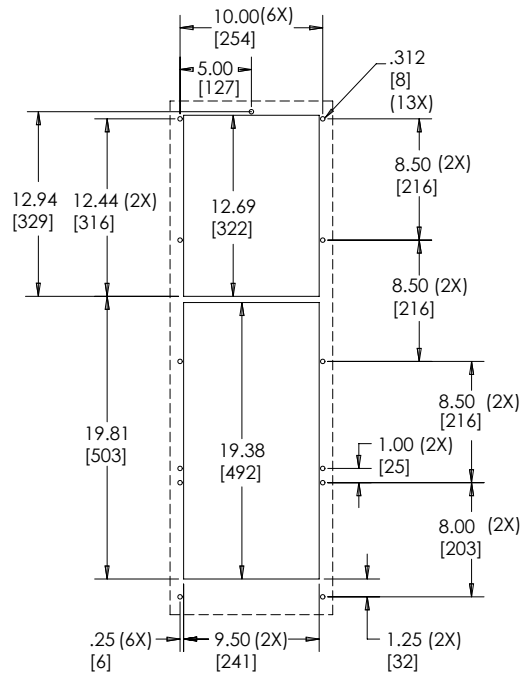
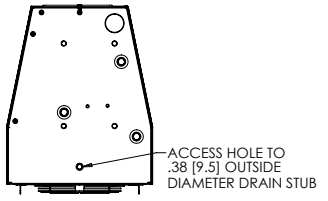
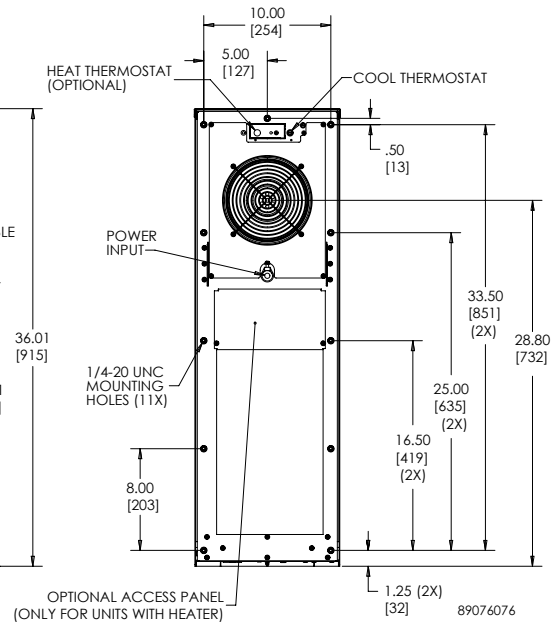
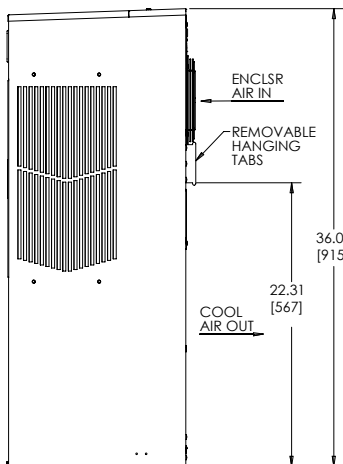
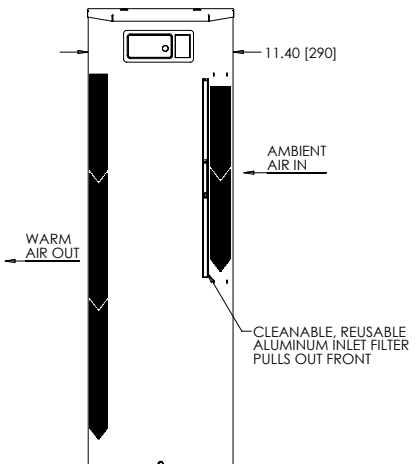
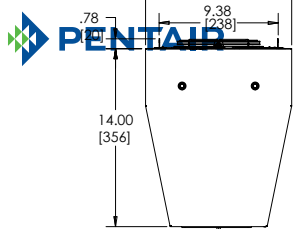
Height (in. / mm)	36.00 / 914.4					
Width (in. / mm)	11.50 / 292.1					
Depth (in. / mm)	14.00 / 355.6					
Weight (lb. / kg)	100 / 45	100 / 45	104 / 47	106 / 48	106 / 48	114 / 52

\*Units with Remote Access Control utilize a digital controller and communicate via EtherNet/IP, Profinet, Modbus TCP/IP and SNMP over ethernet or modbus RTU over USB.

Performance Curves for N36 Models 8000 BTU/Hr. (2344 Watt)



N36 6000/8000 BTU/Hr. (1758/2344 Watt)

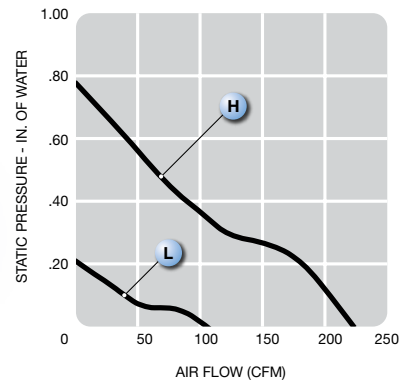
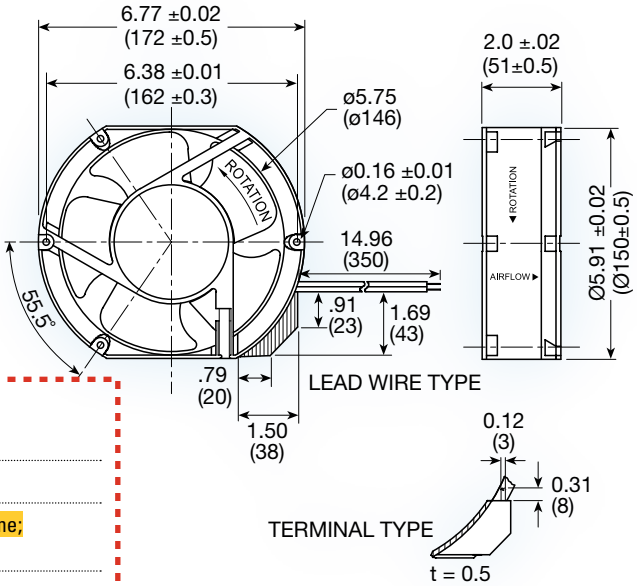


Cutout Dimensions

89076076

# UF15PC series

## Section 2.23 Panel Enclosure Fan



**(172 x 150 x 51 mm)**  
6.77 x 5.91 x 2.0 inches

**Operating voltage:** 115 or 230 VAC

**Construction:** aluminum die cast frame;  
UL94V-0 PBT impeller

**Bearing option:** ball bearing

**Motor:** permanent split capacitor

**Air Flow:** exhaust over struts

**Connection:** terminal or 22 AWG lead wire

**Protection:** thermal

**Option:** dual voltage 115/130VAC; IP55;  
IP55 + salt fog, tachometer output

Model No.	Rated Voltage V	Freq. HZ	Input Power W	Rated Cur. A	Locked Cur. A	Speed RPM	Air Volume		Max. Static Pressure (H <sub>2</sub> O)		Sound Noise dba	Weight kg
							M <sup>3</sup> /Min.	CFM	MM	INCH		
UF15PC12-__H	115	60	31	0.25	0.43	3,400	6.4	226	20.0	0.79	58	0.80
UF15PC23-__H	230	60	29	0.12	0.19	3,400	6.4	226	20.0	0.79	58	0.80
UF15PC12-__L	115	60	31	0.15	0.20	1,700	3.0	106	5.5	0.22	37	0.80
UF15PC23-__L	230	60	29	0.07	0.09	1,700	3.0	106	5.5	0.22	37	0.80





# Riverside County Regional Park and Open-Space District

Kyla Brown, Parks Director / General Manager

Date: Tuesday, February 10, 2026

From: Kyla Brown, General Manager/ Parks Director

To: Board of Supervisors

Via: Joey Zaokopny, Bureau Chief Parks and Recreation (951) 617-0845

Subject: Request for Goods with Services- VFD Pump and Installation

The below information is provided in support of my department requesting review for a single or sole source purchase/agreement with a cost of \$5,000 or more for goods and/or services.

Single Source       Sole Source

Supporting Documents: indicate which are included in the request from the list below.

Supplier Quote       Supplier Sole Source Letter       Final draft agreement

Final draft Form 11       H-11 approved by RCIT/TSOC       Grant Agreement

Other: \_\_\_\_\_ (i.e. CA Secretary of State Business Entity Information, Dept. of Justice Registration Conformation for non-profits, etc.)

1. Requested Supplier Name: SiteOne Green Tech & Precision Pumping Systems  
Supplier ID: 133912



- a. Describe the goods/service being requested: Dual Variable Frequency Drive (VFD) System and Installation for Irrigation Pumps at Rancho Jurupa Regional Park.
- b. Explain the unique features of the goods/services being requested from this supplier: SiteOne Green Tech is the exclusive distributor and certified provider for Precision Pumping Systems VFD control panels, ensuring proper installation and support for these technically complex components.
- c. What are the operational benefits to your department? Upgrade both irrigation pumps at Rancho Jurupa Regional Park to prevent damage caused by ongoing water hammer in the main water lines and to allow automatic watering with our Hunter irrigation system.
- d. Provide details on any cost benefits/discounts. Implementing this system will reduce manual watering of approximately 40% of the park, allowing staff to redirect time and resources.

2. Can this request be formally bid out or procured using a viable solution such as an existing cooperative agreement or existing contract with another department or public entity?

Yes                       No

a. If yes, please explain why you are requesting to utilize an SSJ process?  
N/A

3. Has your department previously requested/received an assigned tracking number for a single or sole source request for this Supplier for the goods/service requested now? *(If yes, please provide the reviewed single or sole source tracking number).*

Yes SSJ# \_\_\_\_\_                       No

a. What was the total annual and aggregate amount? \_\_\_\_\_

4. Identify all costs for this requested in the table below:  
 If review is for multiple years, all costs must be identified below:



**PCS Reviewed:**

Tanya Sida		2/17/26
_____	_____	_____
<b>Print Name</b>	<b>Signature</b>	<b>Date</b>

Note: Once signed by the Department Head and PCS (signature lines above), the PCS will e-mail completed SSJ form with supporting documents to [psolesource@rivco.org](mailto:psolesource@rivco.org), and cc: Supervising PCS. Please reach out to your assigned PCS with any questions.



**The section below is to be completed by the Purchasing Agent or designee.**

**Purchasing Department Review and Comments:** \_\_\_\_\_

Not to exceed:

One-time \$ 74,761.77

Annual Amounts reflected in completed chart for Question #4

Total Cost \$ \_\_\_\_\_

Aggregate Amount \$ \_\_\_\_\_

<i>Stacy Orton</i>	3/24/2026	26-134
_____	_____	_____
<b>Purchasing Agent Signature</b>	<b>Date</b>	<b>Tracking Number</b>

(Reference on Purchasing Documents)