Hart Engineering Corporation

SUBMITTAL:
11301-02

PROJECT: 9900. - Veolia/Taunton WWTF Phase 1 Improvements **DATE: 03/27/2022**

SUBMITTAL: 11301-02 - Induction Mixer O&M Manual
REVISION: 0
STATUS: Eng
SPEC #: 11301

TO:
Michael Andrus
Beta Group Inc.
6 Blackstone Place
Lincoln, RI 02865
MAndrus@BETA-Inc.com

FROM:
Ryan Murphy
Hart Engineering Corporation
800 Scenic View Drive
Cumberland, RI 02864
rmurphy@hartcompanies.com

Item	Revision	Description	Status	Date Sent	Date Returned
11301-02	0	Induction Mixer O&M Manual	Eng	03/27/2022	
Notes:					

Additional Notes:

Status Codes
1-APP – No Exceptions Taken
2-ANR – Make Corrections Noted
3-R&R – Revise and Resubmit
4-REJ – Rejected
5-IPO – For Information Purposes Only
6-NRR – Not Required for Review
ENG – Submitted to Engineer

Sincerely,
Hart Engineering Corporation

_____ DATE: 03/27/2022

OPERATION & MAINTENANCE MANUALS
FOR
HART ENGINEERING CORPORATION
TAUNTON WWTF – CHEMICAL INDUCTION MIXER
PO # 9900.109

3021800334-701-001
MARCH 25, 2022

MANUFACTURER/SERVICE CENTER:
PROMINENT FLUID CONTROLS, INC.
136 INDUSTRY DRIVE
PITTSBURGH, PA 15275
CONTACTS:
GARY PFEFFER, SERVICE MANAGER
SCOTT BRADLEY, PROJECT MANAGER
EMAIL: ProminentCSD-US@prominent.com
TEL: 412-787-2484

CUSTOMER:
HART ENGINEERING CORPORATION
800 SCENIC VIEW DRIVE
CUMBERLAND, RI 02864

TEL: 401-658-4600
FAX: 401-658-4609

SHIP TO:
HART ENGINEERING
825 WEST WATER STREET
TAUNTON, MA 02780

CONTACT: B LITTLE
TEL: 401-302-0092

Table of Contents

SECTION 1

GENERAL INFORMATION

1.1

ProMinent Fluid Controls
136 Industry Drive
Pittsburgh PA, 15275
(412) 787-2484

Section 1

Standard Warranty. Subject to the warranty limitation set forth below, Seller warrants that the Products sold hereunder will substantially conform to Seller's published specifications and will be free from defects in material and workmanship under normal and proper use and service. For pump drive units and controller electronics, the applicable "Warranty Period" for the above stated express warranty shall be two (2) years after delivery EXW. For sensors, the applicable "Warranty Period" for the above stated express warranty shall be six (6) months after delivery EXW. For all other products and for systems, the applicable "Warranty Period" for products and system components covered by Seller's above stated express warranty shall be one (1) year after delivery EXW. Extended warranty periods ("Extended Warranty Plans") may be purchased separately from Seller to extend the Warranty Periods set forth above. Subject to availability, upon payment in full for such Extended Warranty Plans, the Warranty Periods hereunder shall be extended in accordance with Seller's applicable Extended Warranty Plans, subject to all applicable terms and conditions. Drawings, functional specifications, formal submittals and any other requirements documents prepared by Seller and approved by Purchaser shall be deemed the correct interpretations of the work to be performed even if inconsistent with other, conflicting plans and specifications, whether prepared by Seller, Purchaser or otherwise. Upon resale, Purchaser agrees to extend to its customers no greater warranties, and limit its liability and remedies to the same extent, as those set forth herein.

Warranty Limitation. The warranty and remedies for breach of warranty provided for in these General Conditions extend only to the original end-user's production use of Products and do not cover, and Seller shall not be liable for, (i) Third-party products provided/specified by Purchaser, and any other third-party products expressly identified as such, are specifically excluded from Seller's warranty set forth herein. Seller's sole and exclusive warranty liability, responsibility and obligation with respect to such third-party product is to use all commercially reasonable efforts to pass through to Purchaser any applicable warranties provided by the sellers of such third-party products, if any, (ii) Products returned contaminated by chemicals or other substance, (iii) abnormal wear and tear or damage caused by installation, maintenance, or use which is improper or contrary to the instructions published by Seller, (iv) storage of Products in a wet or damp area or unprotected from weather and other job conditions, (v) any cause beyond the control of Seller, including without limitation conditions caused by movement, settlement or structural defects of the environment in which the Products are installed, fire, wind, hail, flood, lightning or other acts of God, any conditions related to, or caused by, failure to process or inaccurate processing of time-sensitive information and/or mechanisms, intentional acts, accidents, negligence or exposure to harmful chemicals, pollutants or other foreign matter or energy, (vi) repair or damage caused by anyone except personnel authorized by Seller, or (vii) any damage to the finish of the Products after they leave Seller's facility. Items repaired or replaced and designs corrected under warranty are warranted until: (a) the expiration of the original warranty period; or (b) ninety (90) days from the date Purchaser receives the repaired or replaced item, whichever is later in time. All Product literature is for illustrative purposes only and does not contain a warranty of any kind. Seller's advice relating to the technical usage of the Products or the intellectual property rights of others, whether provided orally or in writing or through the provision of test results, is given in accordance with Seller's best knowledge at that time, but shall at all times be deemed to be non-binding. Such advice does not relieve Purchaser from the obligation, and Purchaser accepts full responsibility, to confirm for himself the suitability of the Products for the intended purpose(s). THE WARRANTY SET FORTH IN STRICTLY LIMITED TO ITS TERMS AND IS IN LIEU OF ALL OTHER WARRANTIES, GUARANTEES, EXPRESS OR IMPLIED, ARISING BY OPERATION OF LAW, COURSE OF DEALING, USAGE OF TRADE OR OTHERWISE, SPECIFICALLY EXCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Remedy. Purchaser's sole and exclusive remedy, and Seller's only obligation for breach of warranty hereunder, shall be, at Seller's option in its sole discretion, to (i) repair or replace the defective Product (other than Product sold as systems (or skids)) which fails within the applicable Warranty Period, free of charge, provided that Purchaser promptly notifies Seller of such failure and, after receipt of prior written authorization from Seller, returns such Product to the place requested by Seller, freight prepaid, and thereupon Seller finds such to be defective; or (ii) with respect to Products that were sold as systems (or skids), repair or replacement of defective Product which falls within the applicable Warranty Period, free of charge, provided that Purchaser (A) promptly notifies Seller of such failure; (B) properly prepares the Product for service (including without limitation ensuring that the Products to be inspected/serviced are not pressurized, flushing such Products of all substances, and such other preparation as Seller may reasonably specify); and (C) make such Products available for inspection and/or service by Seller's designated service provider in a safe work environment that is appropriate for the work to be performed. Seller reserves the right to charge Purchaser for travel and service time for on-site service technicians in the event Purchaser fails to meet its commitments above. Without limiting the above, Seller may, at its own cost and expense, decide to uninstall and remove the system/skid in question to Seller's designated facility for inspection and/or repair. In such cases, Seller shall also, at its own expense, return the repaired or replaced system/skid to Purchaser's site and install such system/skid. Seller's obligations with respect to breach of warranty are strictly limited to repair, or replacement as stated above. Except as may be otherwise specifically agreed in writing in Seller's quotation or similar written document issued by Seller, Purchaser must pay all other costs related to repair or replacement of Product under warranty, including removal, installation or reinstallation costs. Seller's personnel must be granted access to inspect the Products claimed to be defective at the site of their installation or use.

Any customer's contract specifics signed by ProMinent takes precedence the above standard terms and conditions as related to warranty.

1.2

!!! IMPORTANT – PLEASE READ !!!

ProMinent® SYSTEMS

SITE DELIVERY AND STORAGE CHECKLIST

1. **Check packing list for completeness and note any missing items immediately.**

2. **The skid may have been jarred during shipping. Inspect equipment and shipping container for damage before accepting delivery. Make note on the carrier's bill-of-lading the extent of the damage, if any, and notify the carrier. Save the shipping container until your system is started up.**

3. **Store equipment on firm level surface in original packing container. Do not store equipment where it may be exposed to extreme temperatures, precipitation, humidity, or dust. Avoid direct sunlight that could overheat and damage equipment.**

WARNING – PUMPS MAY BE FILLED WITH OIL WHICH COULD LEAK IF TILTED

Ambient Conditions for storage and transport:

Temperature:	**14°F to 120°F**
Air humidity:	**max. 95% relative humidity, non-condensing**

Please call if you have questions.

ProMinent Fluid Controls, Inc.
RIDC Park West
136 Industry Drive
Pittsburgh, PA 15275-1014
Phone: (412) 787-2484
Fax: (412) 787-0704

!!! IMPORTANT – PLEASE READ !!!

ProMinent® SYSTEMS

PRE-INSTALLATION CHECKLIST

1. **Mount equipment on hard flat level surface. Stainless steel or FRP angle may be used to fasten skids down.**

2. **Do not install equipment in areas of extreme heat, cold, dust or humidity. Avoid areas where objects or fluids can drop from overhead.**

3. **Install piping so connections properly meet skid termination points. Do not "stretch" field installed piping to meet skid termination points. Stressed plastic piping will fail!**

4. **Check the tightness on all unions. Hand tighten only - no tools. Unions incorporate an o-ring seal. Ensure that the o-ring is seated properly before tightening.**

5. **Check the piping for breakage. The skid may have been jarred during shipping.**

6. **Allow provisions for draining the system piping. Skid components will require maintenance. Ensure that chemicals can be evacuated from skid piping and components.**

7. **Do not down-size piping to or from system. Piping should be at least equal in diameter to piping on skid and one or two sizes larger for long runs.**

8. **Install suction line strainer if one was not included with your packaged system**

9. **Avoid getting dirt in piping during installation. Plug ends of piping with rags if construction activities are underway. All debris must be flushed from piping before system start-up.**

10. **Check electrical connections to be sure proper voltage is supplied to unit.**

Please call if you have questions.

ProMinent Fluid Controls, Inc.
RIDC Park West
136 Industry Drive
Pittsburgh, PA 15275-1014
Phone: (412) 787-2484
Fax: (412) 787-0704

!!! IMPORTANT – PLEASE READ !!!

ProMinent® SYSTEMS
QUICK START GUIDE

1. **Pressure Relief Valves and Back Pressure Valves (PRV's/BPV's) are NOT pre-adjusted. ProMinent adjusts valves for QC purposes, but valves must be opened before shipping to allow water to be drained out.**

2. **The PRV's should be set no higher than the lowest rated component – typically the pump. In any case, do not exceed 150 psi with plastic piping. Tighten the PRV only with the a proper sized screwdriver or the furnished adjusting wrench. An improper adjustment tool will damage the valve adjustment screw.**

No extraordinary start-up procedures are required. However, the following steps are recommended. WEAR SAFETY GLASSES WHILE WORKING ON CHEMICAL FEED EQUIPMENT!

a. **Unions tagged with Red Tape are purposely loosened prior to shipping. Check ALL unions for tightness and insure O-ring is properly seated before tightening. DO NOT OVERTIGHTEN! Hand tighten initially, and if necessary, apply one-eighth to one-quarter turn with properly sized wrench. DO NOT OVERTIGHTEN!**

b. **Start the pumps in manual control mode with water – DO NOT APPLY SYSTEM PRESSURE. CHECK MOTOR ROTATION! (clockwise, looking down towards pump). Open oil vent, if applicable. Check for leaks.**

c. **Check pulsation dampener fastener bolts' torque and inflate dampeners before applying system pressure (~80% of System Pressure). Set BPV for at least 15 psi pressure. Set PRV for rated pressure of weakest link in system.**

d. **Run the system in manual mode with water. Build pressure. Check for leaks! Correct all leaks before introducing chemical into the system.**

e. **Familiarize yourself with controls, check functionality of instruments, and verify correct pump output.**

f. **Run the system in automatic mode with water. Verify functionality of alarms and safety devices. Verify correct pump output and functionality of instruments.**

g. **Run the system in automatic mode with chemicals. Allow system to build pressure and check for leaks.**

Please call if you have questions.

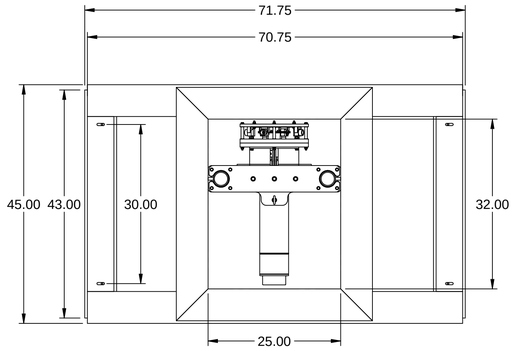
ProMinent Fluid Controls, Inc.
RIDC Park West
136 Industry Drive
Pittsburgh, PA 15275-1014
Phone: (412) 787-2484
Fax: (412) 787-0704

SECTION 2

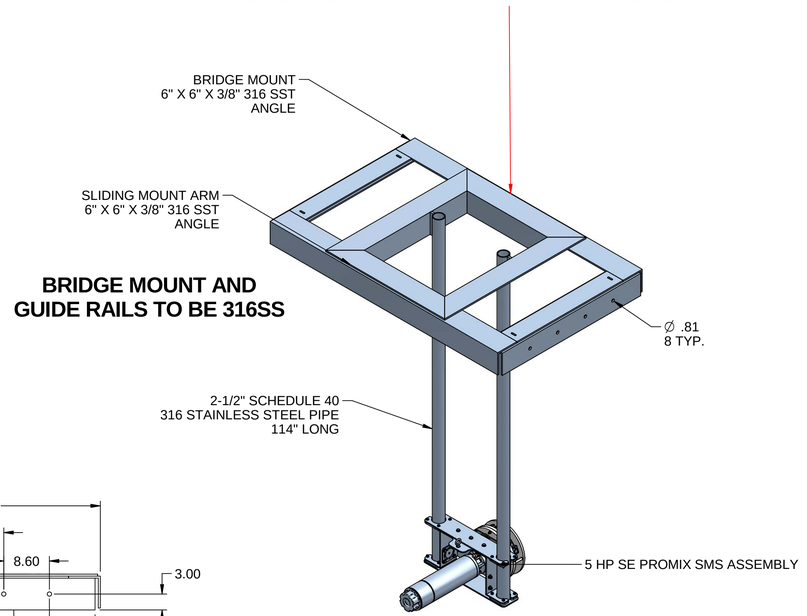
5 HP PROMIX SMS

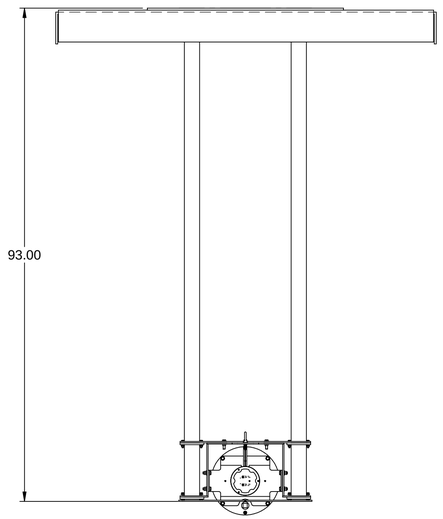
2.1

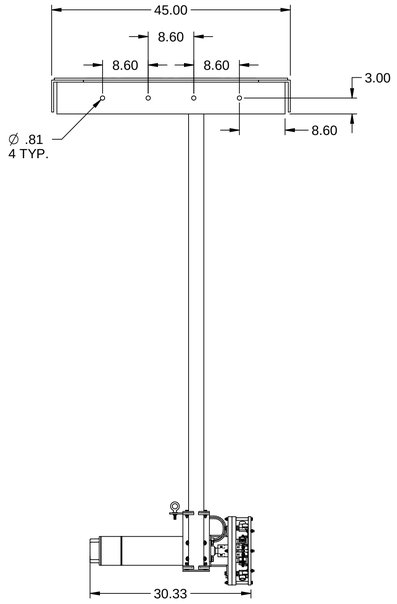
DWG No 3021800334-200 | REV 0



NOTE: G.C. IS TO VERIFY DIMENSIONS







NOTES:

1. SEAL MATERIAL IS VITON UNLESS OTHERWISE SPECIFIED.
2. ALL MOUNTING HARDWARE IS 316SS UNLESS SPECIFIED BY CUSTOMER.
3. ALL PIPING AND COMPONENTS SHALL BE SECURED AT BUILDERS DISCRETION AS SEEN FIT.
4. ALL INTERCONNECTING PIPING, HARDWARE, GASKETS, SEALS, AND WIRING ARE DONE ON SITE BY OTHERS.
5. ALL INTERCONNECTING PIPING SHALL BE FULLY & INDEPENDENTLY SUPPORTED BY OTHERS.
6. TOLERANCE ON ALL TERMINATION POINTS ARE +/- 3/8" (10mm) UNLESS SPECIFIED BY OTHERS.
7. ESTIMATED MIXER WEIGHT: 135 LBS
   ESTIMATED OVERALL ASSEMBLY WEIGHT: 845 LBS

CHEMICAL SERVICE:

-SODIUM HYPOCHLORITE

NETWORK NUMBERS:

-MECHANICAL: 1101338
-ELECTRICAL: 1101339
-SPARE PARTS: 101460

ITEMS TO SHIP LOOSE:

(1) KURI-TECH HOSE ASSEMBLY (SEE DRAWING 3021800334-210)
(1) MOTOR FILLING ITEMS
(1) DAVIT CRANE ASSEMBLY
(1) 1" PVC BACK PRESSURE VALVE, GRIFFCO BPG100P
(1) NEMA 4X CONTROL PANEL (SEE DRAWING 1081083)

REV	DATE	DESCRIPTION	BY	APPD	REVD
0	12/17/21	RELEASE FOR PRODUCTION	LJM		
B	12/02/21	CUSTOMER COMMENTS	LJM		
A	10/29/21	FIRST ISSUE	LJM		

REVISIONS

CUSTOMER: HART ENGINEERING (VEOLIA/TAUNTON WWTF - CHEMICAL INDUCTION MIXER)

JOB No 3021800334 | PURCHASE ORDER No 9900.109

TITLE: 5 HP PROMIX SMS SODIUM HYPO GENERAL ARRANGEMENT

ENGINEERS SEAL

ProMinent® THE PROMINENT GROUP OF COMPANIES

PITTSBURGH, PA USA | WWW.PROMINENT.US

PROMINENT FLUID CONTROLS INC.
RIDC PARK WEST
136 INDUSTRY DRIVE,
PITTSBURGH P.A., USA. 15275
TEL. 412 787 2484 FAX. 412 787 0704

DESIGNED	LJM	APPROVED	SB
DRAWN	LJM	SCALE	N.T.S.
CHECKED	JDB	DATE	10/29/21

DWG No 3021800334-200 | REV 0 | PAGE 1/2

DWG No	REV
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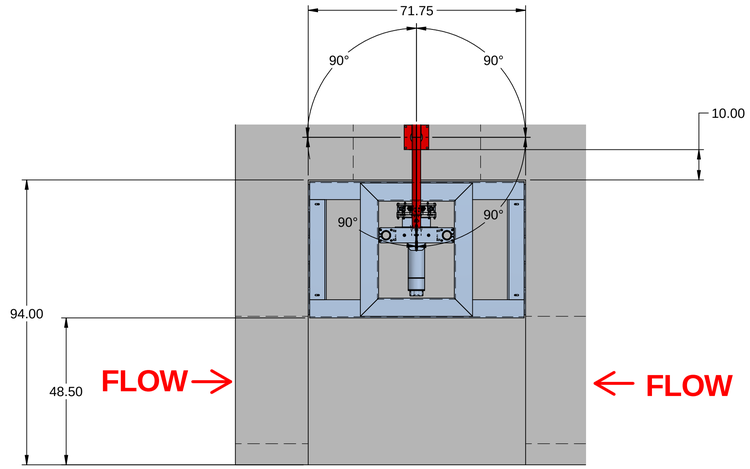
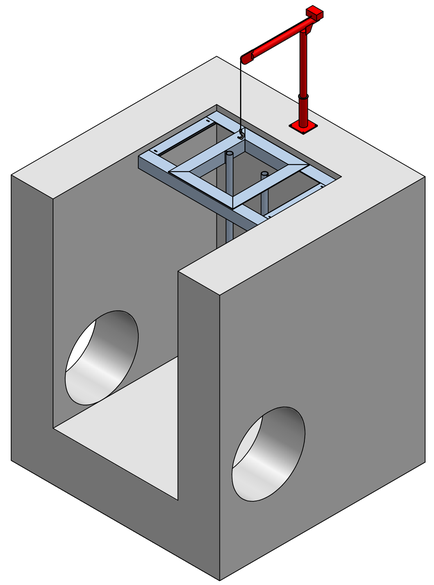
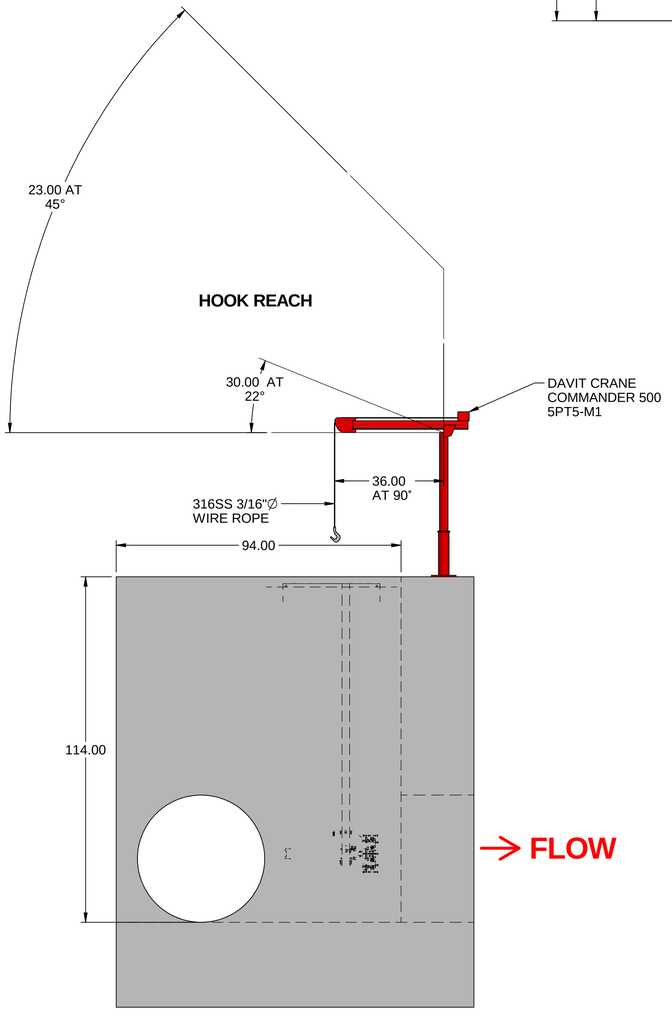
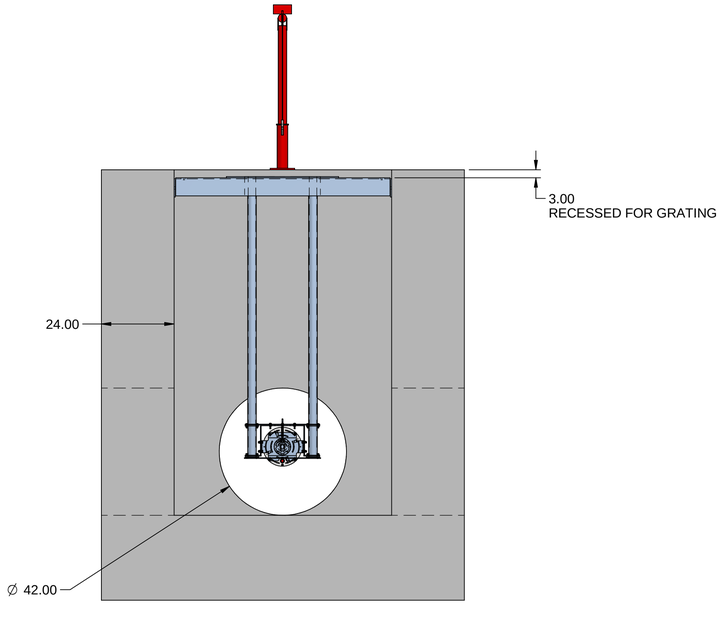


PLAN VIEW



ISOMETRIC VIEW
W/ TANK CUTAWAY





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0	12/17/21	RELEASE FOR PRODUCTION	LJM		
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A	10/29/21	FIRST ISSUE	LJM		

REVISIONS

CUSTOMER: HART ENGINEERING
(VEOLIA/TAUNTON WWTF - CHEMICAL INDUCTION MIXER)

JOB No: 3021800334 | PURCHASE ORDER No: 9900.109

TITLE: 5 HP PROMIX SMS SODIUM HYPO
GENERAL ARRANGEMENT

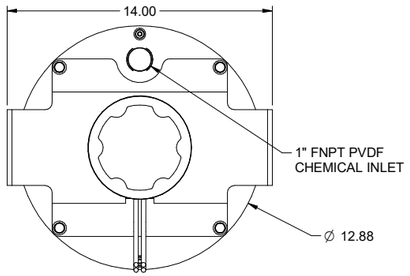
ENGINEERS SEAL

ProMinent®
THE PROMINENT GROUP OF COMPANIES
PITTSBURGH, PA USA | WWW.PROMINENT.US
PROMINENT FLUID CONTROLS INC.
RIDC PARK WEST
136 INDUSTRY DRIVE,
PITTSBURGH P.A., USA. 15275
TEL. 412 787 2484 FAX. 412 787 0704

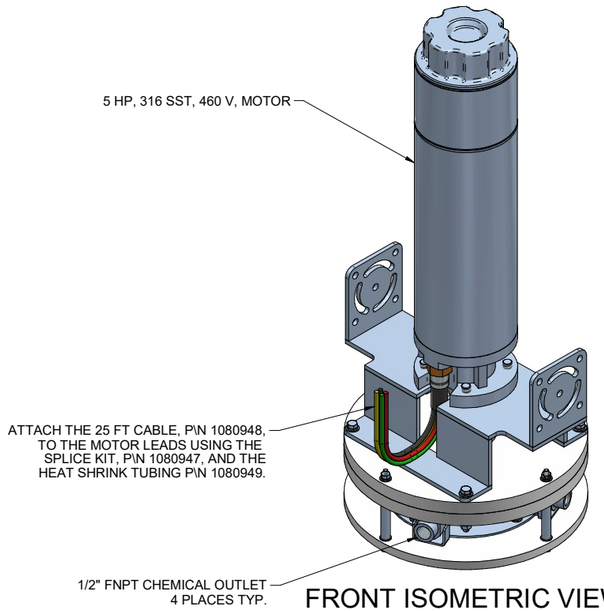
DESIGNED	LJM	APPROVED	SB
DRAWN	LJM	SCALE	N.T.S.
CHECKED	JDB	DATE	10/29/21

DWG No	REV	PAGE
3021800334-200	0	2/2

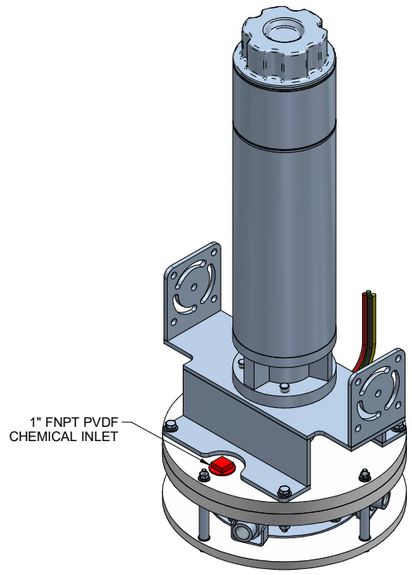
DWG No 1102745-400 | REV B



PLAN VIEW



FRONT ISOMETRIC VIEW

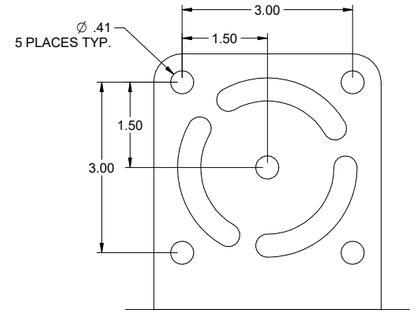


REAR ISOMETRIC VIEW

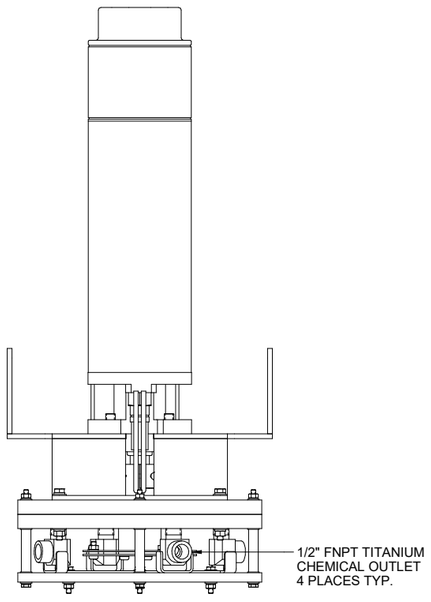
NOTES:

1. MATERIALS OF CONSTRUCTION:
   316 STAINLESS STEEL
   TITANIUM
   PVDF
2. APPROMIMATE WEIGHT: 140 LBS
3. 25 FT OF SOOW, 12/4 CABLE IS STANDARD.
4. QUANTITY OF (1) CABLE GRIP, P\N 1102478, TO BE SHIPPED LOOSE WITH THE MIXER.
5. ALL DIMENSIONS ARE IN INCHES AND ARE SHOWN FOR REFERENCE ONLY.
6. THE FOLLOWING PARTS ARE USED TO CHANGE CHEMICAL FLOW RATE. A QUANTITY OF (4) EACH ARE REQUIRED FOR THE MIXER. THESE PARTS ARE ORDERED SEPARATELY PER PROJECT.

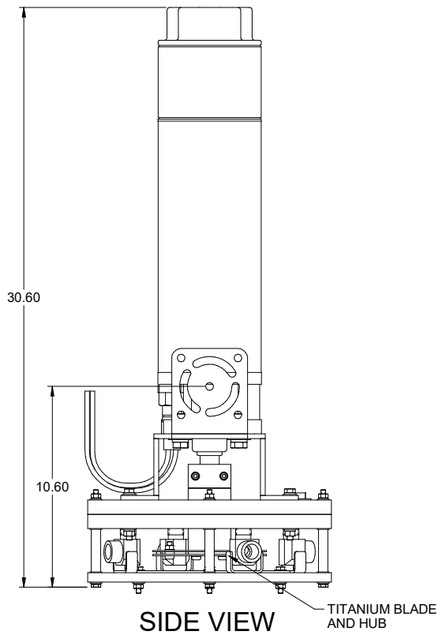
1080935	SIZE 2 NOZZLE, REQUIRES REDUCER BUSHING, 7741389
1080936	SIZE 5 NOZZLE, REQUIRES REDUCER BUSHING, 7741389
1080937	SIZE 8 NOZZLE, REQUIRES REDUCER BUSHING, 7741389
1080938	SIZE 10 NOZZLE, REQUIRES REDUCER BUSHING, 7741389
7741389	REDUCER BUSHING REQUIRED WHEN USING A NOZZLE
1112632	INJECTION QUILL



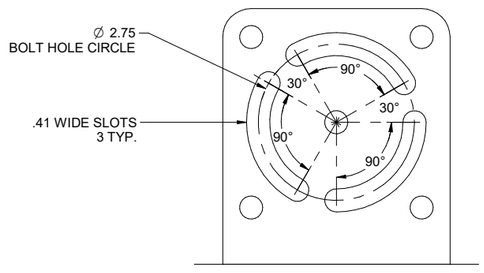
STATIC 0 OR 90 DEGREE
MOUNTING HOLES
USE (4) 3/8-16 HARDWARE



FRONT VIEW



SIDE VIEW



ADJUSTABLE FROM 0 TO 90 DEGREES
MOUNTING SLOTS\HOLE
USE (4) 3/8-16 HARDWARE

REV	DATE	DESCRIPTION	BY	APPD	REVD
B	10/28/20	CHANGES PER CR 000143/CR 000148/CR 000151	GJS		
A	01/10/20	CHANGES PER CR 000118	GJS		
0	03/14/19	FIRST ISSUE	GJS		

REVISIONS

CUSTOMER: PROMINENT FLUID CONTROLS INC. (PROMIX SMS)

JOB No: 1102745 | PURCHASE ORDER No: N\A

TITLE: 5 HP, 460 VAC, SE, PROMIX SMS ASSEMBLY DRAWING

ENGINEERS SEAL

ProMinent® THE PROMINENT GROUP OF COMPANIES

PITTSBURGH, PA USA | WWW.PROMINENT.US

PROMINENT FLUID CONTROLS LTD.
490 SOUTHGATE DRIVE.
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N1H 6J3
TEL. 519 836 5692 FAX. 519 836 5226

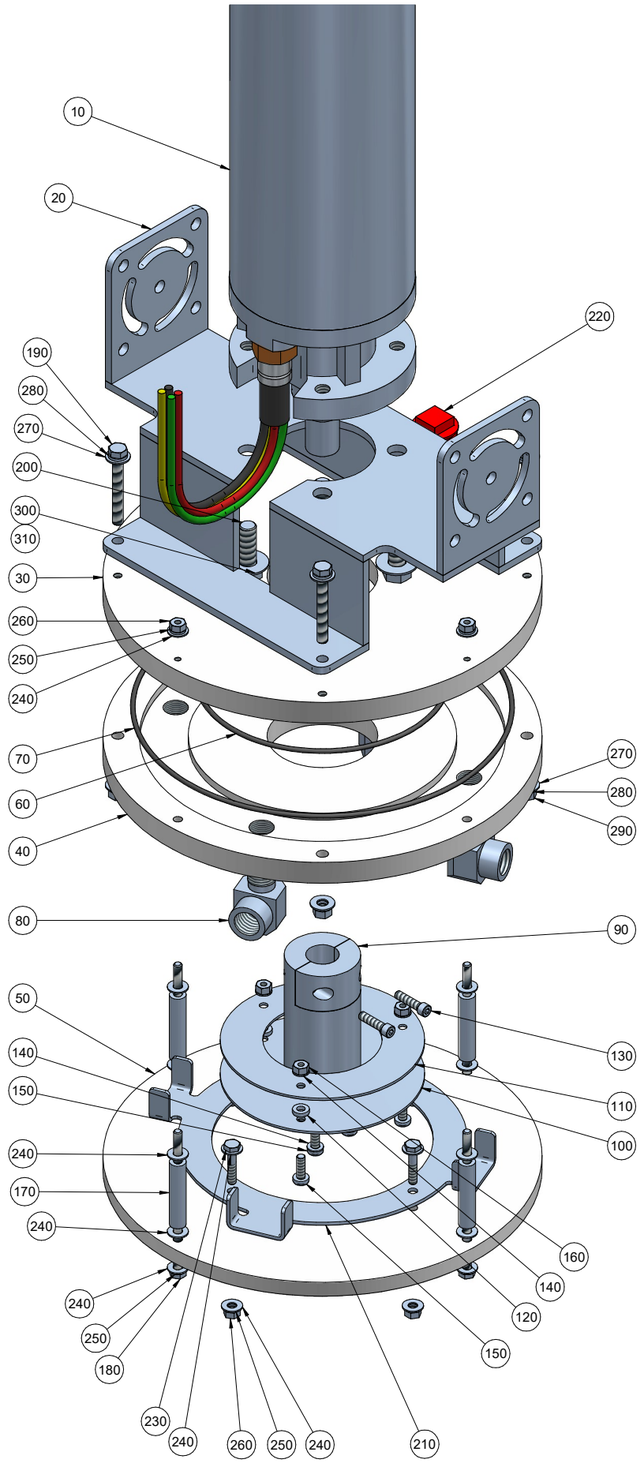
PROMINENT FLUID CONTROLS INC.
RIDC PARK WEST
136 INDUSTRY DRIVE,
PITTSBURGH P.A., USA. 15275
TEL. 412 787 2484 FAX. 412 787 0704

DESIGNED	GJS	APPROVED	RLM
DRAWN	GJS	SCALE	N.T.S.
CHECKED	RLM	DATE	03/14/19

DWG No 1102745-400 | REV B | PAGE 1/12

DWG No 1102745-400 | REV B

ITEM #	USA P\N	QTY.	UN	SAP	DESCRIPTION
10	1080782	1	EA	L	MOTOR, SUBMERSIBLE, 5HP, 6", NEMA, 3PH, 460V
20	1107367	1	EA	L	BRACKET, MIXER, 5/10 HP, WJ, PROMIX SMS
30	1080751	1	EA	L	PLENUM, UPPER, 5/10 HP. PROMIX SMS
40	1102457	1	EA	L	PLENUM, LOWER, 5/10 HP. SE PROMIX SMS
50	1107326	1	EA	L	GUARD, BLADE, 5/10 HP, WJ, PROMIX SMS
60	1080792	1	EA	L	O-RING, 1/8" X 7.234 ID, AS 568-263, VITON
70	1080793	1	EA	L	O-RING, 1/8" X 10.984 ID, AS 568-276, VITON
80	1102468	4	EA	L	ELBOW, STREET, 1/2", FNPT X MNPT, GRADE 4 TITANIUM, 150 #
90	1102460	1	EA	L	HUB, BLADE, 6" SUBMERSIBLE MOTOR, TI, SE, PROMIX SMS
100	1107291	1	EA	L	BLADE, BASE, 6" DIAMETER, 5 HP, WJ, PROMIX SMS
110	1107292	1	EA	L	BLADE, MIXING, 6" DIAMETER, 5 HP, WJ, PROMIX SMS
120	1080736	3	EA	L	SPACER, 1/2" OD, 1/4" ID, 1/8" THICK, TITANIUM
130	1102469	2	EA	L	SCREW, 1/4-20 X 1", TITANIUM, SOCKET HEAD CAP, TORX
140	1080762	6	EA	L	WASHER, LOCK, 1/4", TI
150	1080763	6	EA	L	SCREW, 1/4-20 X 3/4", TITANIUM, TORX PAN HEAD
160	1080761	3	EA	L	NUT, 1/4-20, TI
170	1102473	4	EA	L	SPACER, 1/2" OD, 1/4" ID, 2-1/4" LONG, 316
180	1102471	4	EA	L	BOLT, 1/4-20 X 5", 316 SST, FULLY THREADED
190	1080795	4	EA	L	BOLT, 5/16-18 X 2-1/2", 316 SST, FULLY THREADED
200	1080858	4	EA	L	BOLT, 1/2-20 X 1-1/2", 316 SST
210	1113981	1	EA	L	BRACKET, ANTI-ROTATION, 5/10 HP, PROMIX SMS
220	7744690	1	EA	L	CAP PLUG, 1",
230	STOCK	4	EA	L	BOLT, 1/4-20 X 1-1/4", 316 SST
240	STOCK	24	EA	L	WASHER, FLAT, 1/4", 316 SST
250	STOCK	12	EA	L	WASHER, LOCK, 1/4", 316 SST
260	STOCK	8	EA	L	NUT, 1/4-20, 316 SST
270	STOCK	8	EA	L	WASHER, FLAT, 5/16", 316 SST
280	STOCK	8	EA	L	WASHER, LOCK, 5/16", 316 SST
290	STOCK	4	EA	L	NUT, 5/16-18, 316 SST
300	STOCK	4	EA	L	WASHER, FLAT, 1/2", 316 SST
310*	STOCK	4	EA	L	WASHER, LOCK, 1/2", 316 SST



ASSEMBLY NOTES:

1. PARTS NOT SHOWN ON THE BOM:

   1080947 SPLICE KIT
   1080948 25 FT, SOOW, 12/4 CABLE
   1080949 HEAT SHRINK TUBING
   1102478, CABLE GRIP

2. USE THE SPLICE KIT, P\N 1080947, AND THE HEAT SHRINK TUBING, P\N 1080949, TO ATTACH THE 25 FT, SOOW, 12/4 CABLE, P\N 1080948, TO THE MOTOR.

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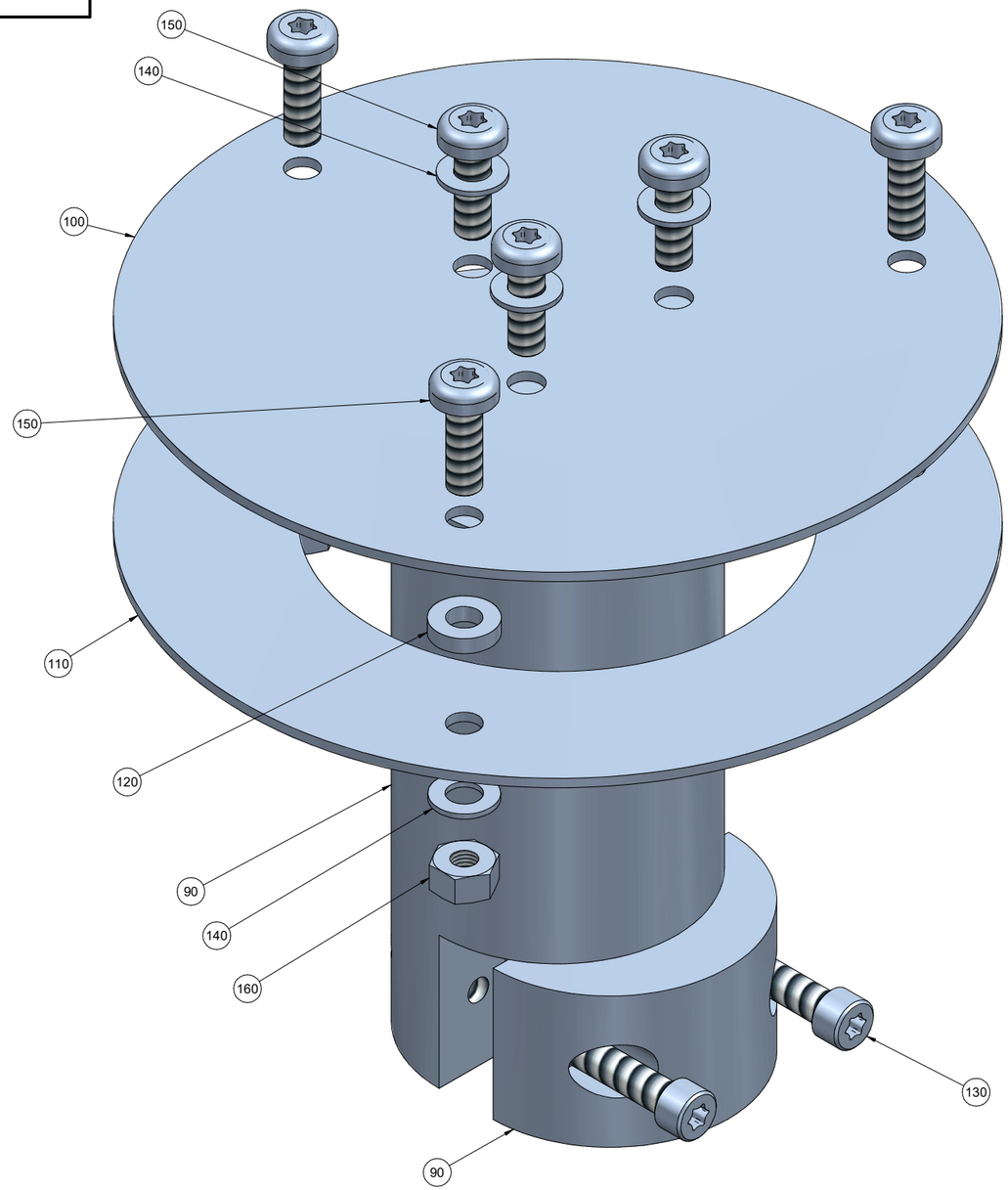
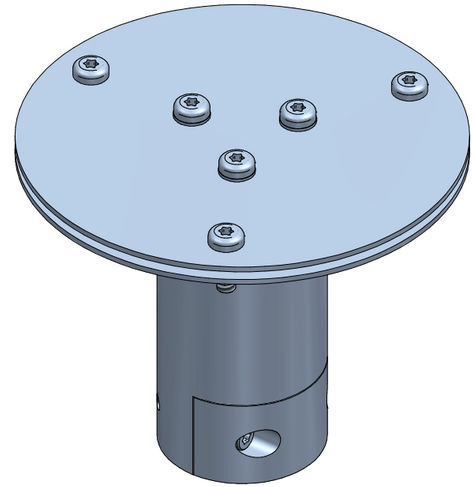
DWG No 1102745-400 | REV B

ITEM #	USA P\N	QTY.	UN	SAP	DESCRIPTION
90	1102460	1	EA	L	HUB, BLADE, 6" SUBMERSIBLE MOTOR, TI, SE, PROMIX SMS
100	1107291	1	EA	L	BLADE, BASE, 6" DIAMETER, 5 HP, WJ, PROMIX SMS
110	1107292	1	EA	L	BLADE, MIXING, 6" DIAMETER, 5 HP, WJ, PROMIX SMS
120	1080736	3	EA	L	SPACER, 1/2" OD, 1/4" ID, 1/8" THICK, TITANIUM
130	1102469	2	EA	L	SCREW, 1/4-20 X 1", TITANIUM, SOCKET HEAD CAP, TORX
140	1080762	6	EA	L	WASHER, LOCK, 1/4", TI
150	1080763	6	EA	L	SCREW, 1/4-20 X 3/4", TITANIUM, TORX PAN HEAD
160	1080761	3	EA	L	NUT, 1/4-20, TI



REFER TO THE BILL OF MATERIALS FOR ADDITIONAL INFORMATION.



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DWG No 1102745-400 | REV B |

DWG No	REV
1102745-400	B

USING (2) 1/4-20 x 1", SOCKET HEAD SCREWS, ITEM 130, LOOSELY ATTACH THE BLADE HUB CLAMP TO THE BLADE HUB BODY, ITEM 90.

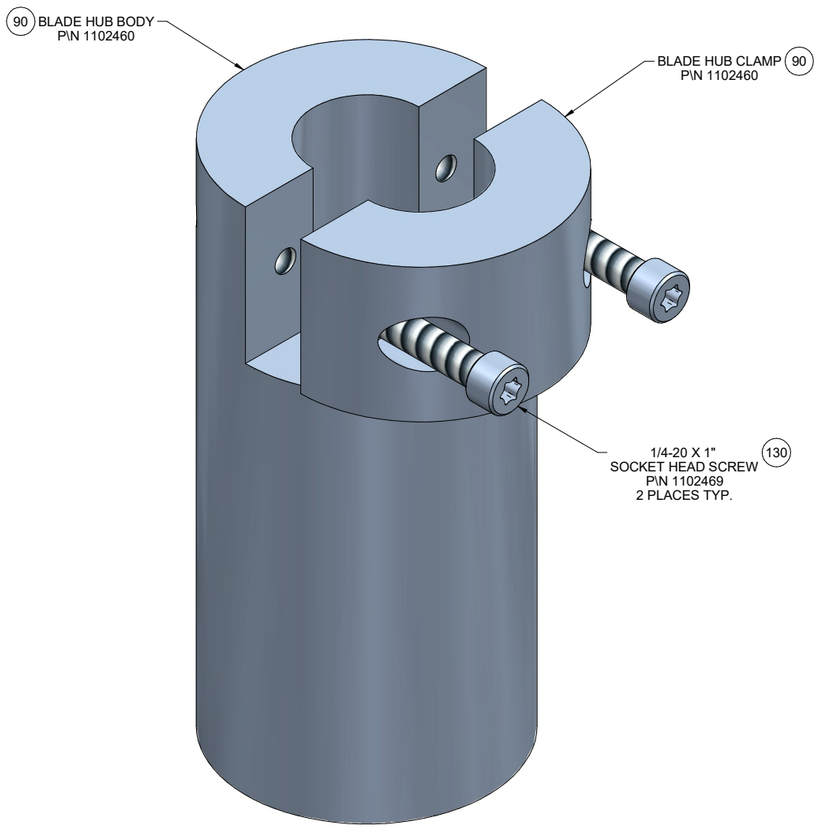
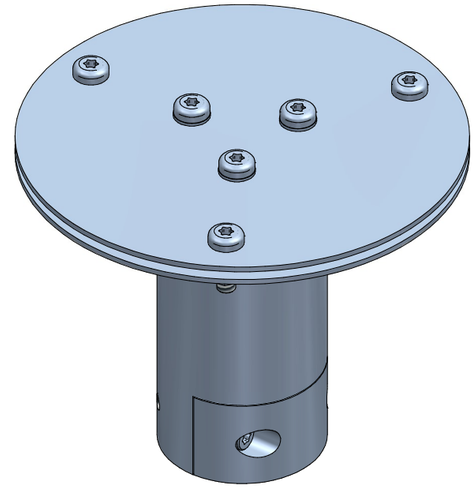


FIGURE 1

FLIP THE BLADE HUB SO THAT THE (3) TAPPED HOLES ARE FACING UPWARDS AS SHOWN.

FIGURE 2

REFER TO THE BILL OF MATERIALS ON SHEET 2 OR SHEET 3 FOR ADDITIONAL INFORMATION.



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DWG No	REV	PAGE
1102745-400	B	4/12

DWG No 1102745-400 | REV B

USING (3) 1/4-20 X 3/4" PAN HEAD SCREWS, ITEM 150, AND (3) 1/4" LOCK WASHERS, ITEM 140, ATTACH THE BASE BLADE, ITEM 100, TO THE BLADE HUB, ITEM 90.

NOTE: APPLY BLUE LOCTITE 242 TO THE THREADS OF THE SCREWS.
TORQUE THE SCREWS TO 4.6 FT-LBS.

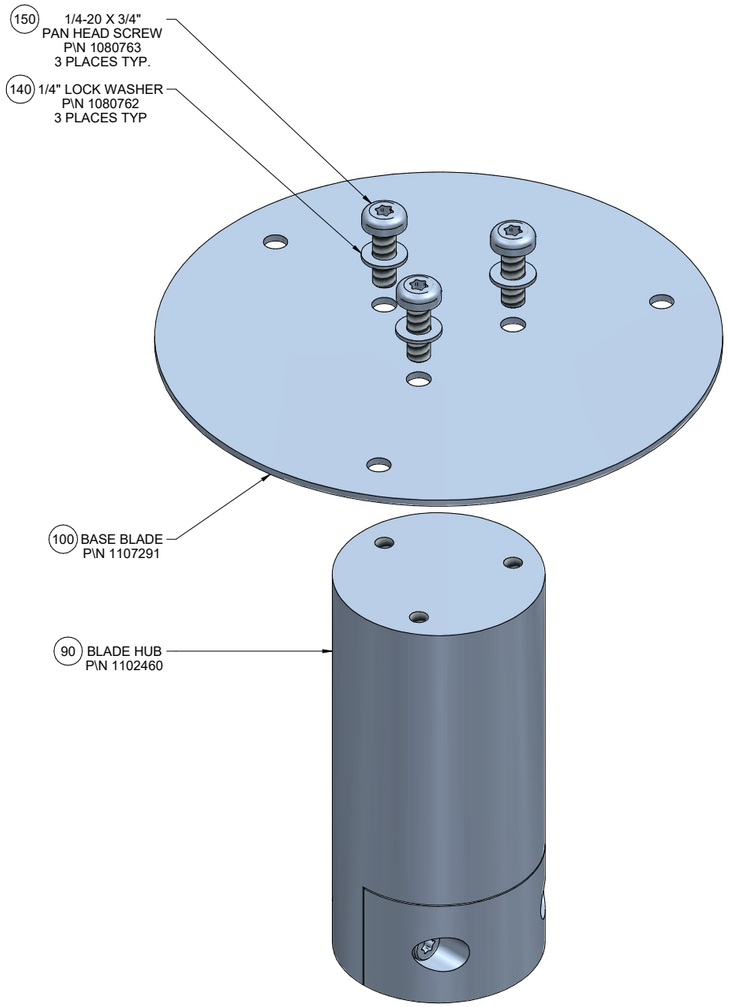


FIGURE 3

FLIP THE BLADE HUB ASSEMBLY SO THAT THE CLAMPED END IS FACING UP AND INSTALL (3) 1/4-20 X 3/4" PAN HEAD SCREWS, ITEM 150, AS SHOWN.

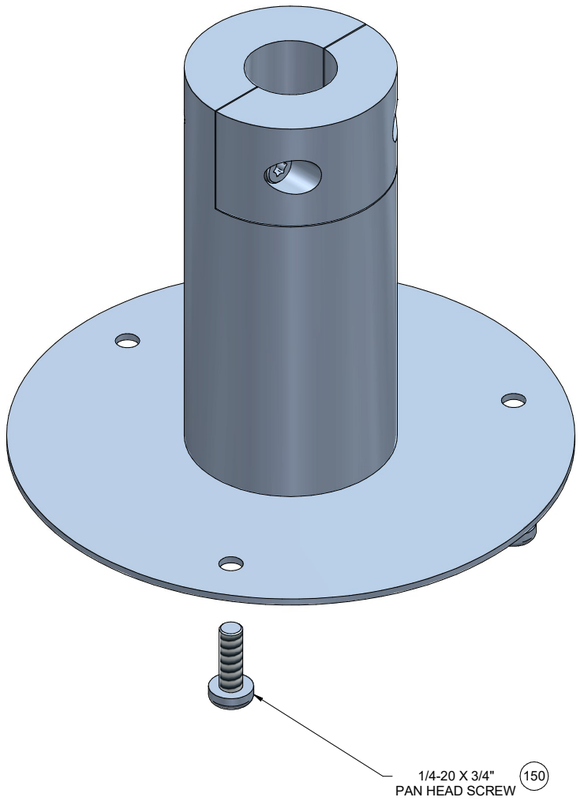
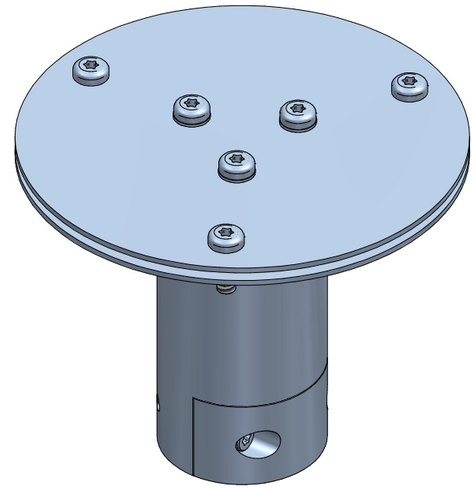


FIGURE 4

REFER TO THE BILL OF MATERIALS ON SHEET 2 OR SHEET 3 FOR ADDITIONAL INFORMATION.



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DWG No 1102745-400 | REV B

PLACE (3) SPACERS, ITEM 120, ON TO THE BLADE HUB ASSEMBLY.

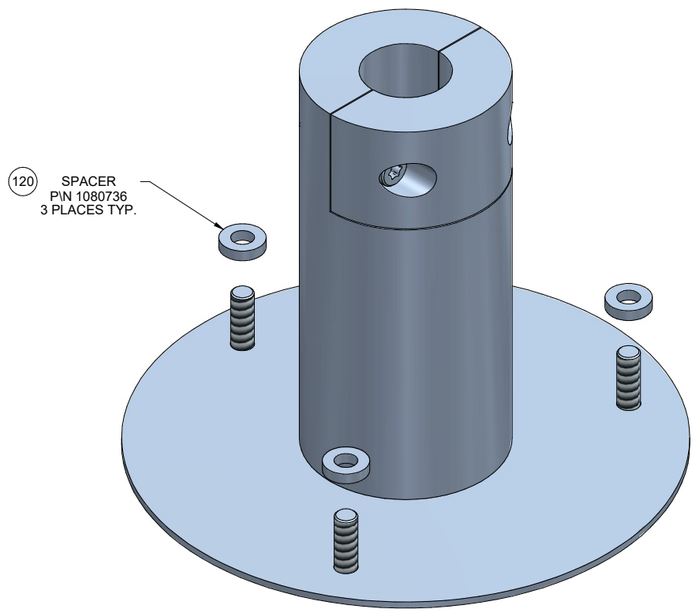


FIGURE 5

PLACE THE MIXING BLADE, ITEM 110, ON TO THE BLADE HUB ASSEMBLY.

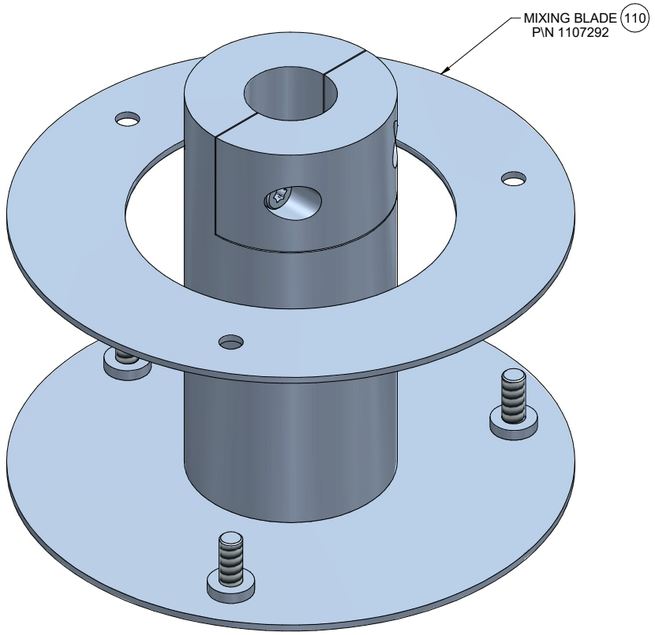
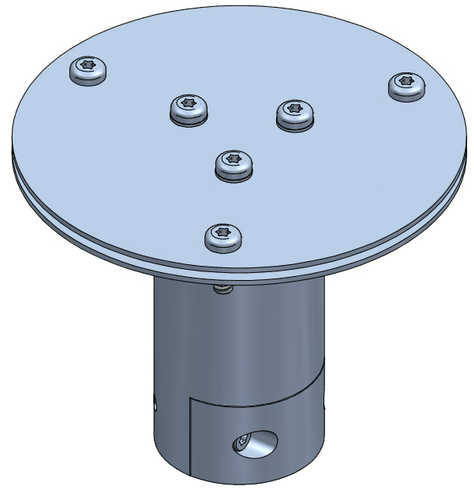


FIGURE 6

REFER TO THE BILL OF MATERIALS ON SHEET 2 OR SHEET 3 FOR ADDITIONAL INFORMATION.



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DWG No 1102745-400 | REV B

USING (3) 1/4-20 NUTS, ITEM 160, AND (3) 1/4" LOCK WASHERS, ITEM 140, SECURE THE MIXING BLADE, ITEM 110, TO THE BLADE ASSEMBLY.

NOTE: APPLY BLUE LOCTITE 242 TO THE THREADS OF THE NUTS.
TORQUE THE NUTS TO 4.6 FT-LBS.

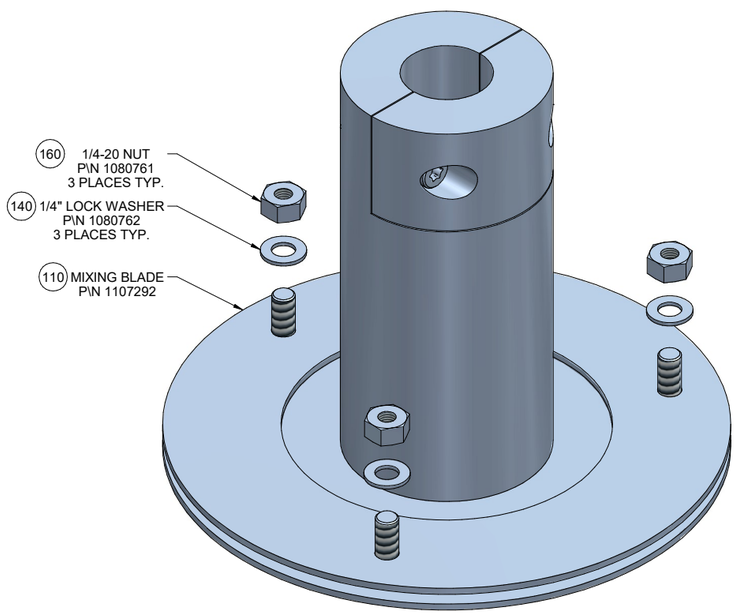


FIGURE 7

COMPLETED MIXER BLADE HUB ASSEMBLY.

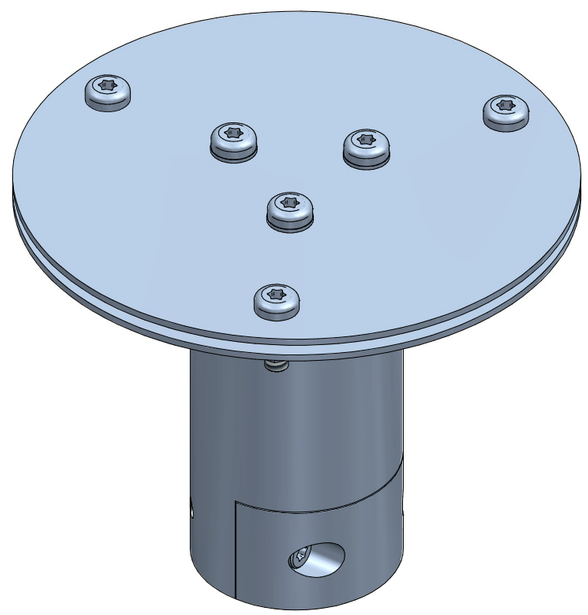
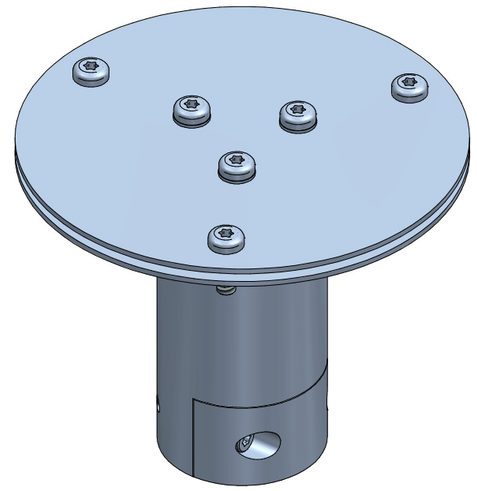


FIGURE 8

REFER TO THE BILL OF MATERIALS ON SHEET 2 OR SHEET 3 FOR ADDITIONAL INFORMATION.



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PLACE THE MOTOR, ITEM 1, ON THE GROUND AS SHOWN.

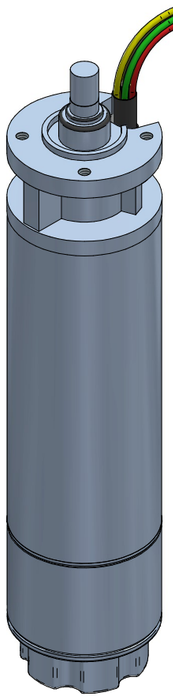


FIGURE 9

USING (4) 1/2-11 NUTS, ITEM 200, (4) 1/2" LOCK WASHERS, ITEM 310, AND (4) 1/2" FLAT WASHERS, ITEM 300, SECURE THE MOTOR MOUNTING BRACKET, ITEM 20, TO THE MOTOR, ITEM 10.

NOTE: APPLY BLUE LOCTITE 242 TO THE THREADS OF THE SCREWS.
TORQUE THE SCREWS TO 50 FT-LBS.

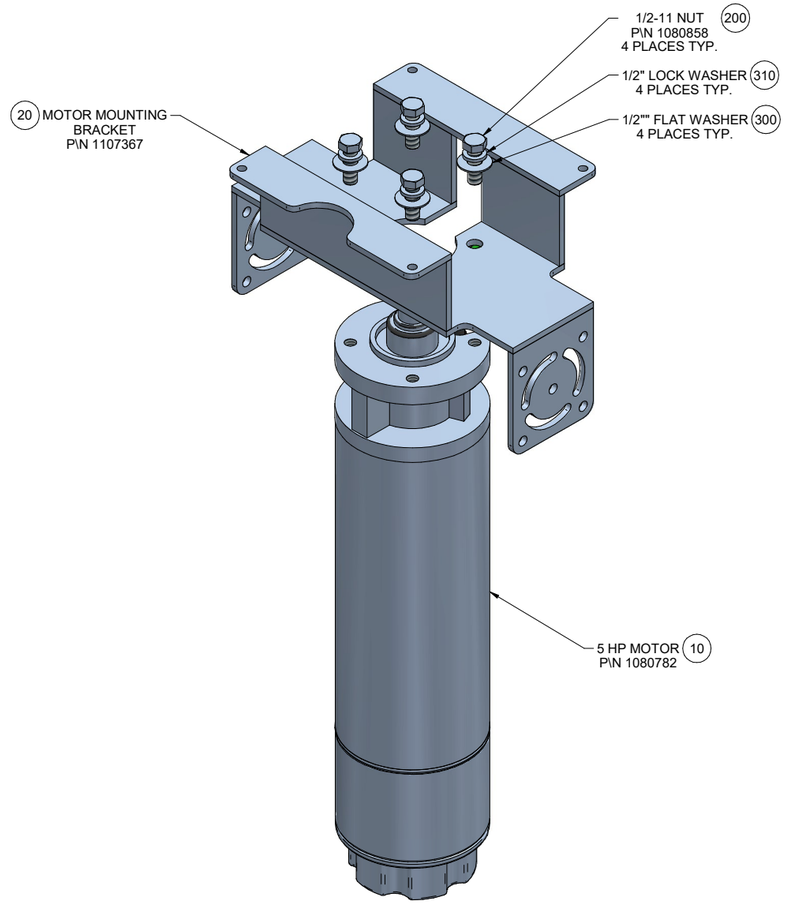
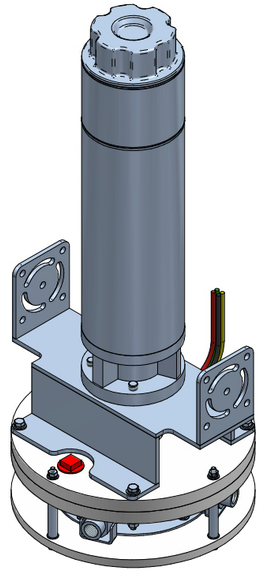


FIGURE 10

REFER TO THE BILL OF MATERIALS ON SHEET 2 FOR ADDITIONAL INFORMATION.



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USING (4) 5/16-18 X 2-1/2" BOLTS, ITEM 190, (4) 5/16" LOCK WASHERS, ITEM 280, AND (4) 5/16" FLAT WASHERS, ITEM 270, SECURE THE UPPER PLENUM, ITEM 30, TO THE MIXER ASSEMBLY.

NOTE: DO NOT APPLY LOCTITE THE THREADS OF THE SCREWS AS IT CAN DAMAGE THE PLENUM.
TORQUE THE SCREWS TO 9.6 FT-LBS.

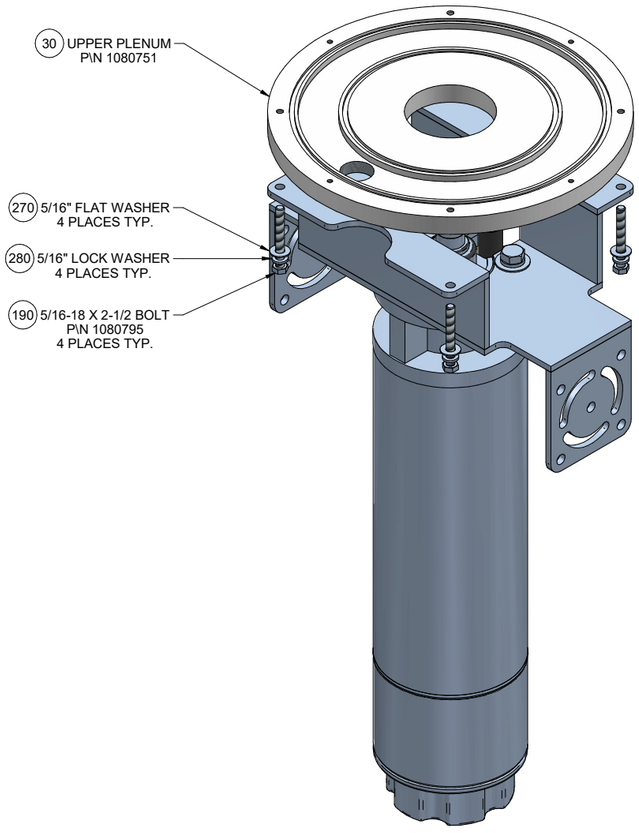


FIGURE 11

PLACE THE SMALL O-RING, ITEM 60, AND THE LARGE O-RING, ITEM 70, INTO THE GROOVES ON THE UPPER PLENUM, ITEM 30.

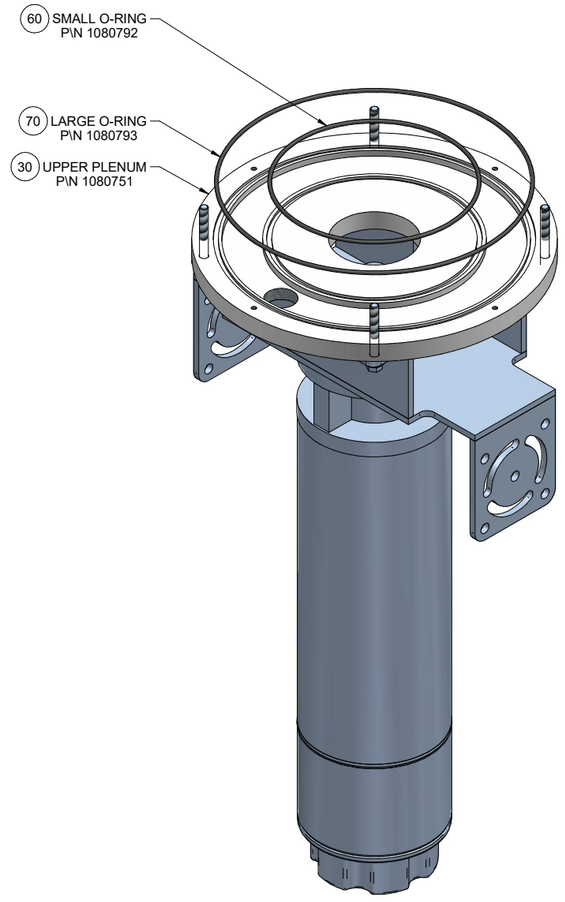
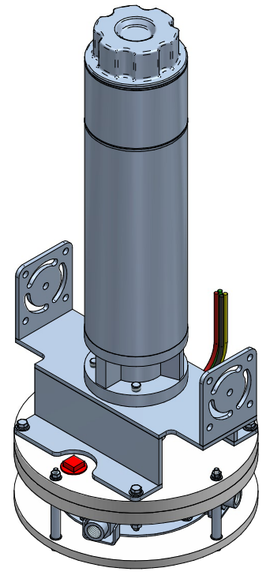


FIGURE 12

REFER TO THE BILL OF MATERIALS ON SHEET 2 FOR ADDITIONAL INFORMATION.



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USING (4) 5/16-18 NUTS, ITEM 290, (4) 5/16" LOCK WASHERS, ITEM 280, AND (4) 5/16" FLAT WASHERS, ITEM 270, SECURE THE LOWER PLENUM, ITEM 40, TO THE MIXER ASSEMBLY.

ENSURE THAT THE O-RINGS STAY IN PLACE.

NOTE: APPLY BLUE LOCTITE 242 TO THE THREADS OF THE NUTS.
TORQUE THE NUTS TO 9.6 FT-LBS.

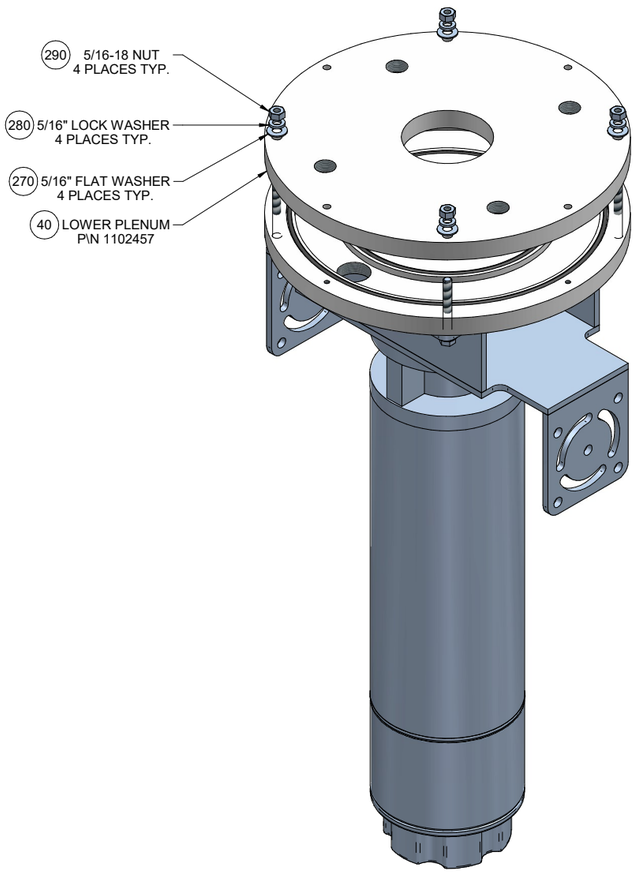


FIGURE 13

THREAD (4) 1/2" STREET ELBOWS, ITEM 80, INTO THE LOWER PLENUM, ITEM 40.

NOTE THE ORIENTATION OF THE STREET ELBOWS.

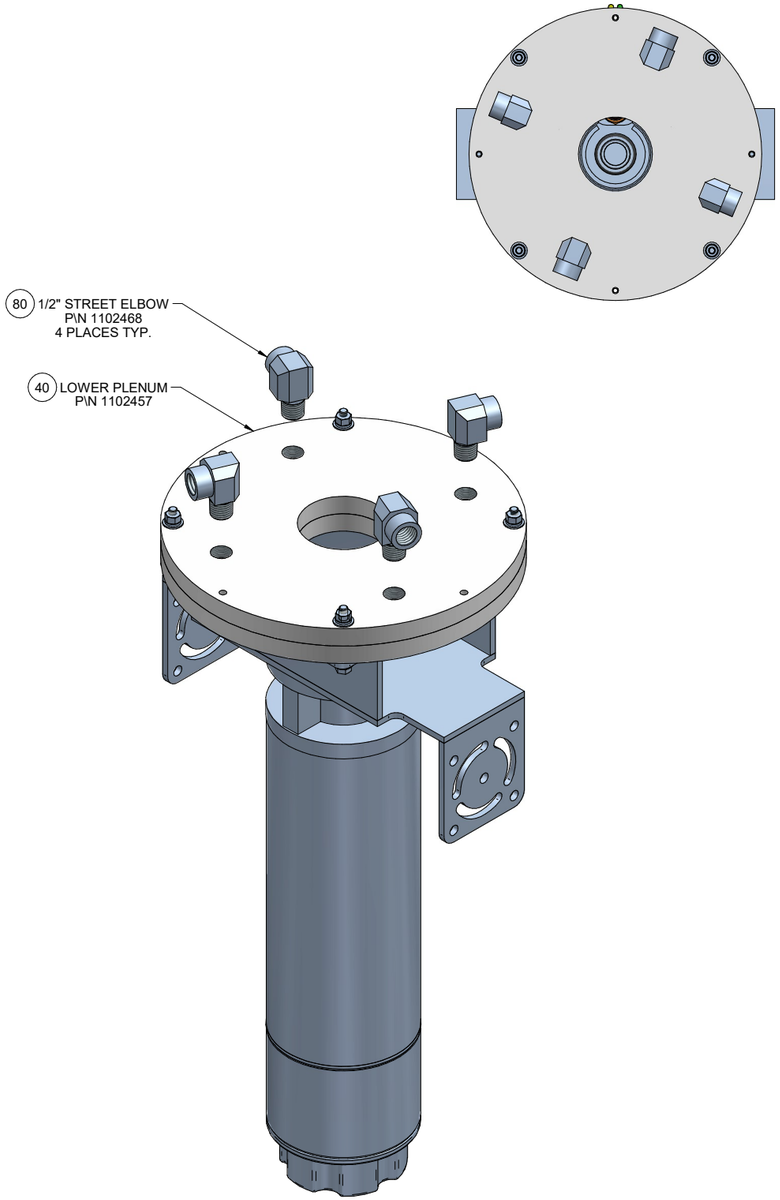
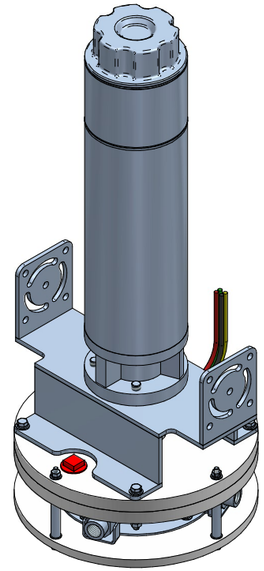


FIGURE 14

REFER TO THE BILL OF MATERIALS ON SHEET 2 FOR ADDITIONAL INFORMATION.



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0	03/14/19	FIRST ISSUE	GJS		

REVISIONS

CUSTOMER PROMINENT FLUID CONTROLS INC. (PROMIX SMS)

JOB No 1102745 | PURCHASE ORDER No N\A

TITLE 5 HP, 460 VAC, SE, PROMIX SMS ASSEMBLY DRAWING

ENGINEERS SEAL

ProMinent® THE PROMINENT GROUP OF COMPANIES

PITTSBURGH, PA USA | WWW.PROMINENT.US

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DESIGNED	GJS	APPROVED	RLM
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CHECKED	RLM	DATE	03/14/19

REMOVE THE (2) LOOSELY ATTACHED 1/4-20 x 1", SOCKET HEAD SCREWS, ITEM 130. PLACE THE COMPLETED BLADE HUB ASSEMBLY ALL THE WAY DOWN ON THE MOTOR SHAFT. APPLY BLUE LOCTITE 242 TO THREADS OF THE SOCKET HEAD SCREWS. TIGHTEN THE (2) SOCKET HEADS SCREWS ON THE BLADE HUB ASSEMBLY TO SECURE THE BLADE HUB ASSEMBLY TO THE MOTOR SHAFT.

NOTE: APPLY BLUE LOCTITE 242 TO THE THREADS OF THE SOCKET HEAD SCREWS.
TORQUE THE SCREWS TO 12 FT-LBS.

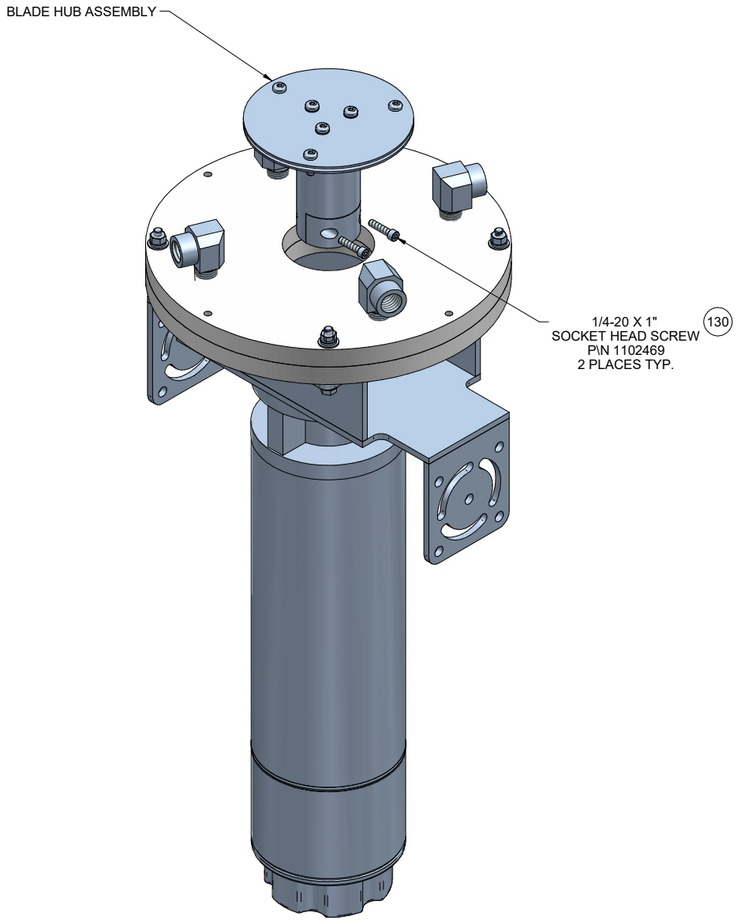


FIGURE 15

USING (4) 1/4-20 X 1-1/4" BOLTS, ITEM 230, (4) 1/4-20 NUTS, ITEM 260, (4) 1/4" LOCK WASHERS, ITEM 250, AND (8) 1/4" FLAT WASHERS, ITEM 240, SECURE THE ANTI-ROTAION BRACKET, ITEM 210, TO THE BLADE GUARD, ITEM 50.

NOTE: APPLY BLUE LOCTITE 242 TO THE THREADS OF THE NUTS.
TORQUE THE NUTS TO 6 FT-LBS.

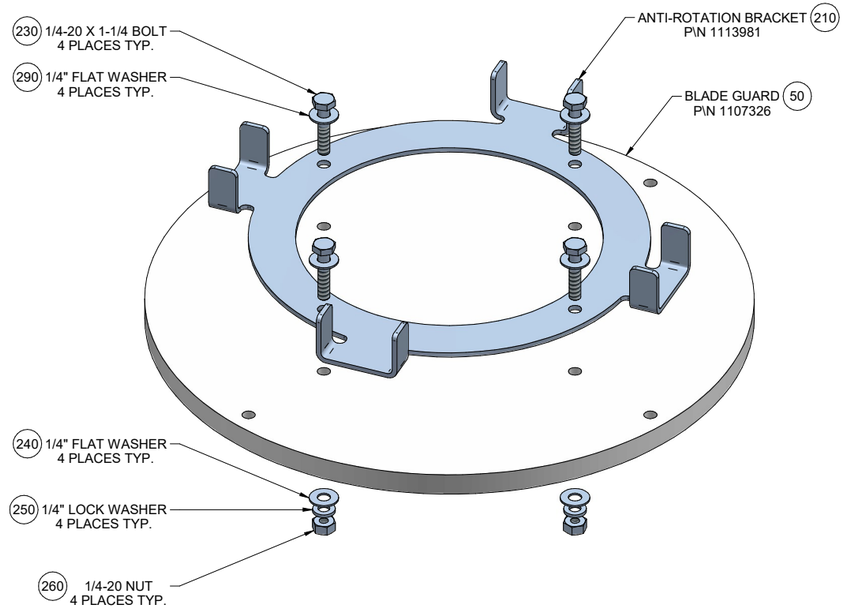
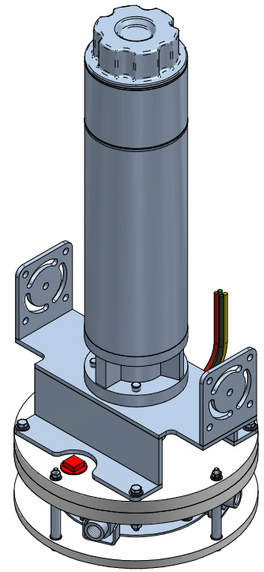


FIGURE 16

REFER TO THE BILL OF MATERIALS ON SHEET 2 FOR ADDITIONAL INFORMATION.



REV	DATE	DESCRIPTION	BY	APPD	REVD
B	10/28/20	CHANGES PER CR 000143/CR 000148/CR 000151	GJS		
A	01/10/20	CHANGES PER CR 000118	GJS		
0	03/14/19	FIRST ISSUE	GJS		

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CHECKED	RLM	DATE	03/14/19

DWG No 1102745-400 | REV B

USING (4) 1/4-20 X 5" BOLTS, ITEM 180, (4) 2-1/4" LONG SPACERS, ITEM 170, (4) 1/4-20 NUTS, ITEM 260, (8) 1/4" LOCK WASHERS, ITEM 250, AND (16) 1/4" FLAT WASHERS, ITEM 240, SECURE THE BLADE GUARD, ASSEMBLY TO THE MIXER ASSEMBLY. ADJUST THE ELBOWS AS NECESSARY TO ALLOW THE ANTI-ROTATION BRACKET ON THE GUARD ASSEMBLY TO FIT AROUND THE ELBOWS PROPERLY.

NOTE: APPLY BLUE LOCTITE 242 TO THE THREADS OF THE NUTS.
TORQUE THE NUTS TO 6 FT-LBS.

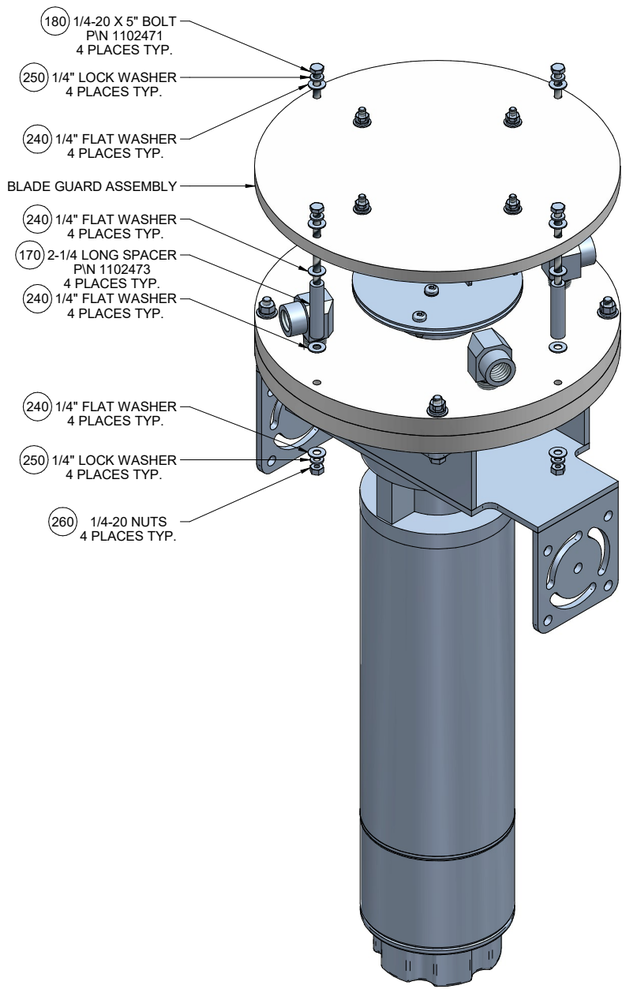


FIGURE 17

COMPLETED ASSEMBLY.

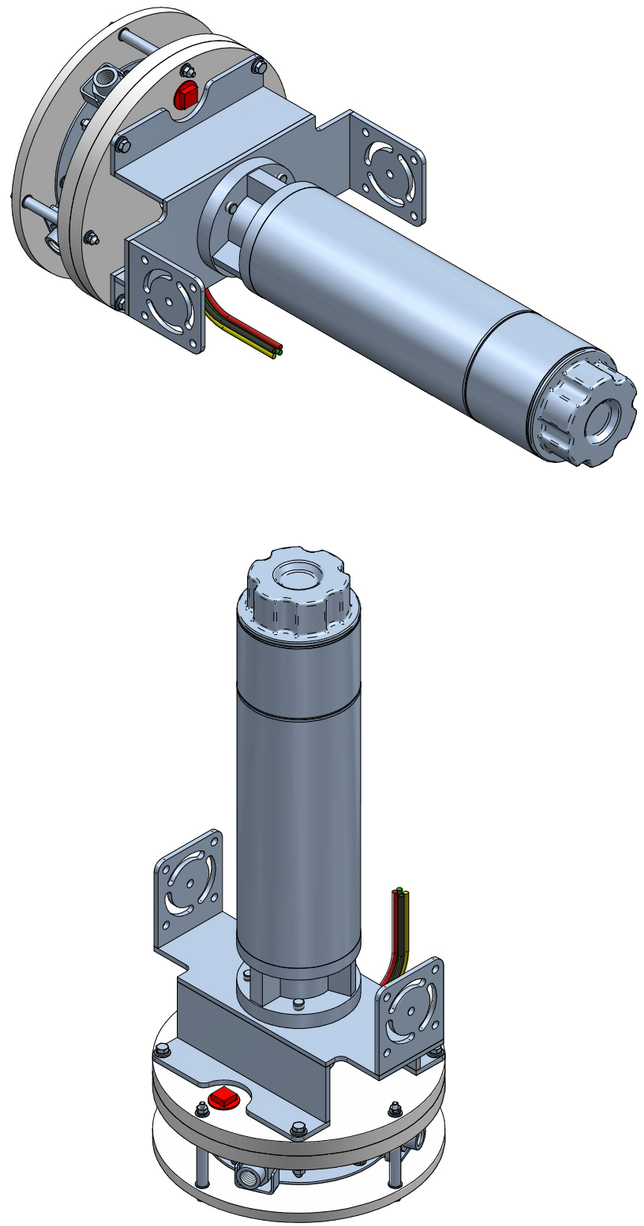
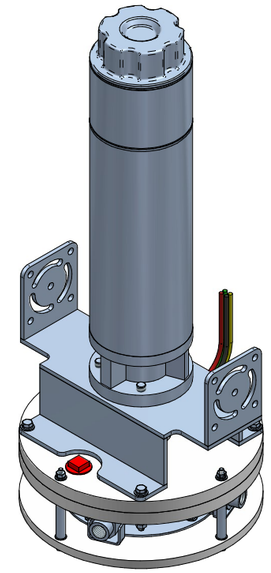


FIGURE 18

REFER TO THE BILL OF MATERIALS ON SHEET 2 FOR ADDITIONAL INFORMATION.



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DWG No 1102745-400 | REV B | PAGE 12/12

2.2

ProMix™ SMS

Minimize chemical dosage and maximize chemical effectiveness!

*The introduction of **ProMinent's New ProMix™ SMS** brings a new and effective way for rapid mix and dispersion of water treatment chemicals and disinfectants. The unique design allows for ease of installation and in many cases eliminates custom mounting rails and costly installation labor.*

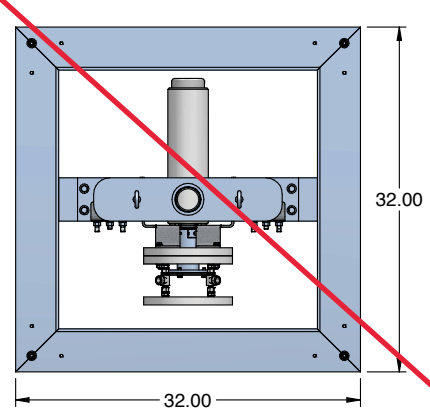
The mixing blade design minimizes and in some cases eliminates scaling problems which lead to premature failures. The chemical injection points can be adjusted to enhance maximum performance in various flows and installation configurations offering optimum results for performance and control of chemical additions.

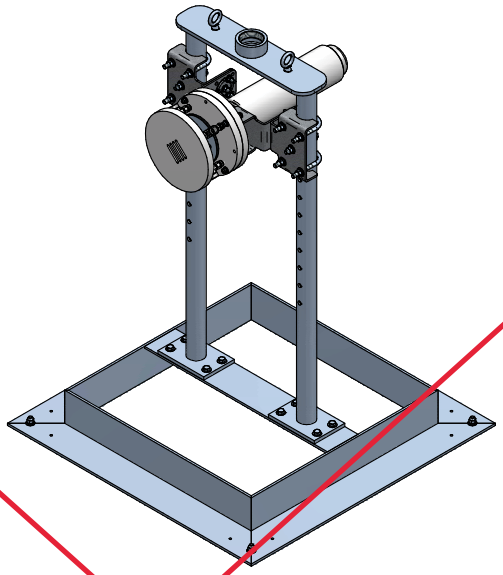
Features & Benefits

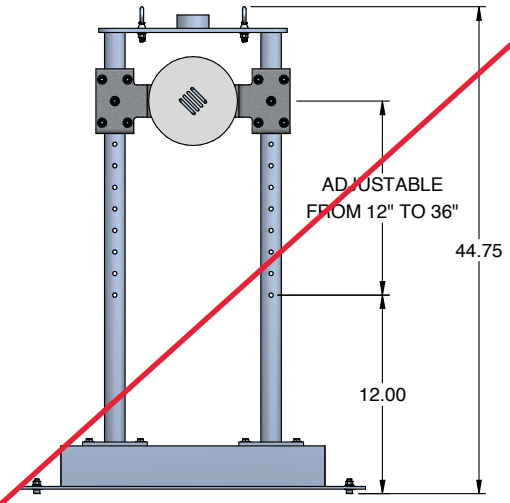
- Rapid chemical dispersion
- Broad coverage, low horsepower
- Enhanced chemical reactions
- Works with most liquid chemicals
- Designed for easy installation
- Maximum chemical performance, minimum chemical dosage
- Channel for power and chemical lines
- Designed to minimize scaling
- Enhances process control, reduces lag times
- Eliminates short circuiting in process
- Adaptable for custom and retrofit installations
- 2, 5, 10 HP models available

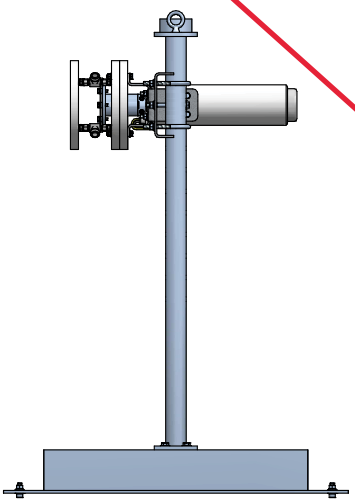
ProMix™ SMS

Dimensional drawings (2 HP model shown)









General sizing guideline

ProMix™ SMS Horsepower	Pipe diameter in feet
2	up to 4
5	4 to 8
10	8 to 16+

General sizing guide for estimation only. Application review is required before model selection.

ProMinent®
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email: sales-US@prominent.com • **www.prominent.us**

PN: 7750246
Submersible_Mixer.indd rev2 12/08/2017

Operating Instructions ProMinent® ProMix SMS Chemical Mixing Systems

Please completely read through these operating instructions first! Do not discard! The warranty may be voided due to damage caused by operating errors!

Ver.04_05_2019

ProMinent Fluid Controls, Inc. (USA), 136 Industry Drive, Pittsburgh, PA 15275

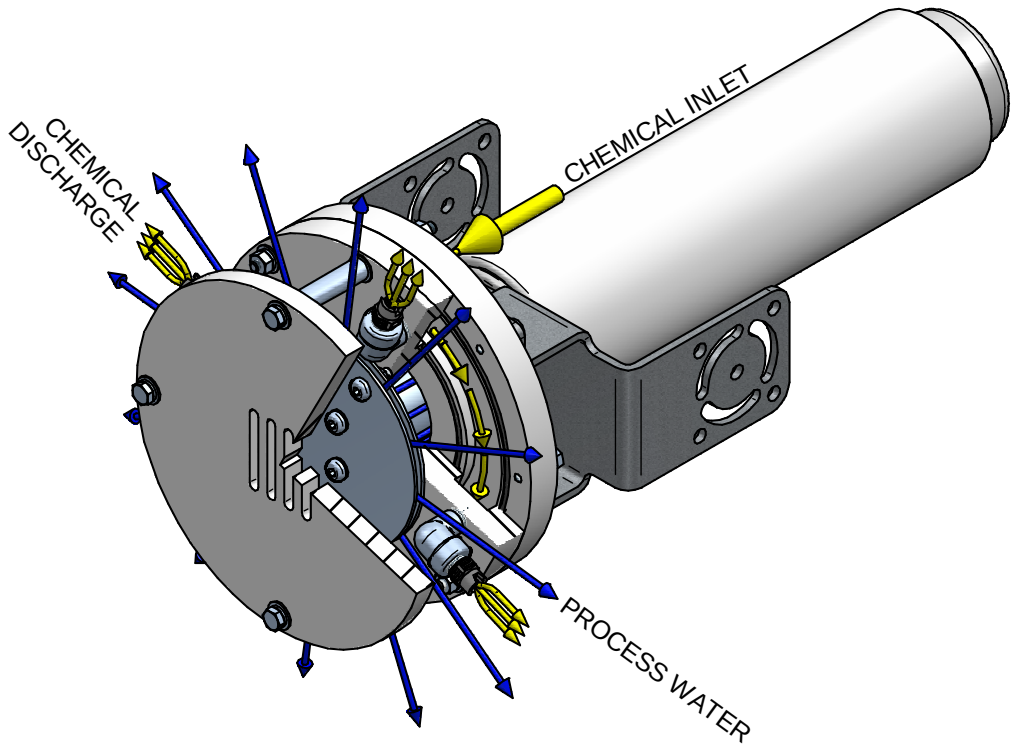
Table of Contents

Contents

General Description

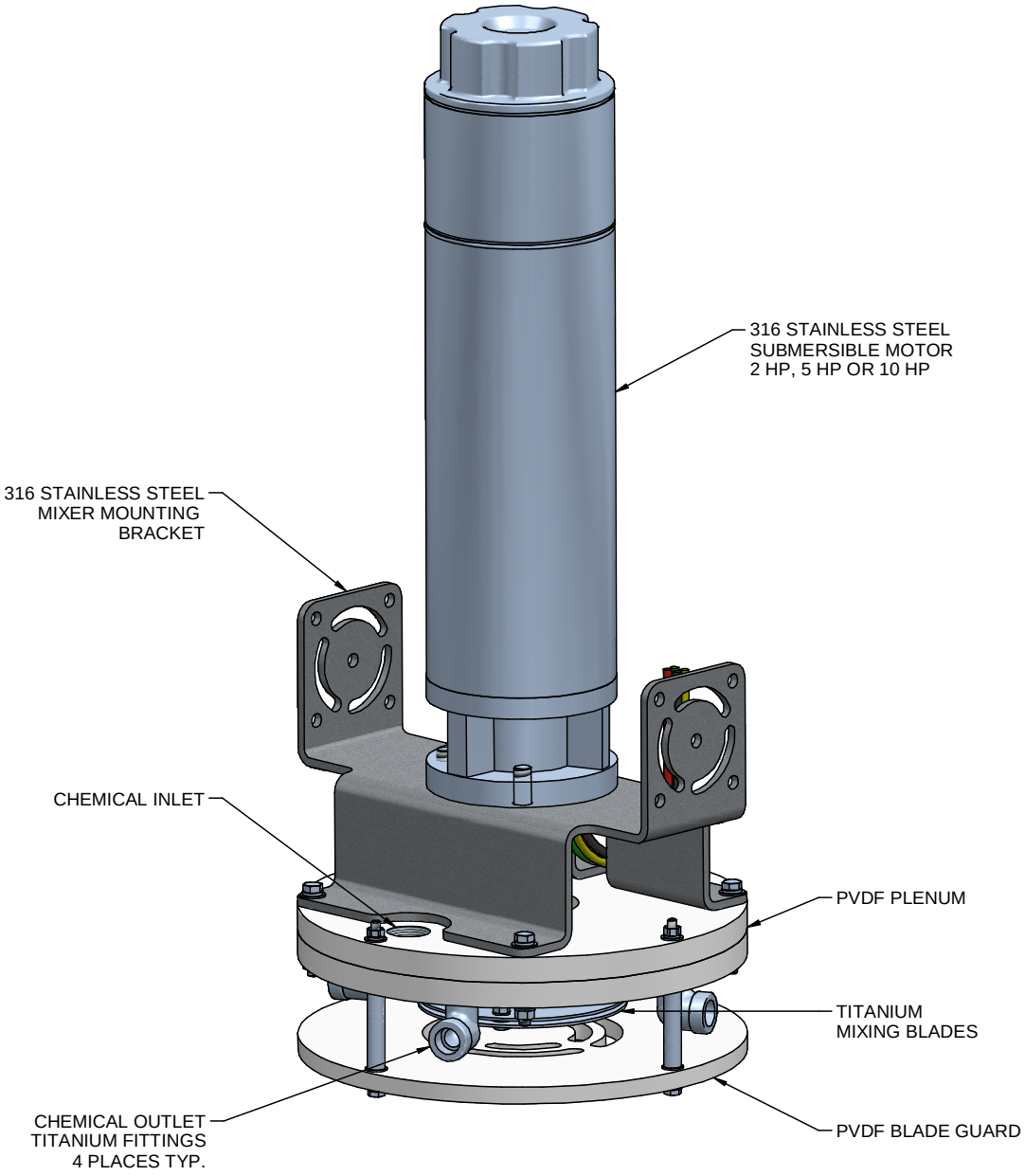
The ProMix SMS is a submersible mixer designed to disperse liquid chemical into a process stream. The chemical is metered to the mixer at the desired rate, and the ProMix SMS will effectively disperse it across the process stream.

Figure 1



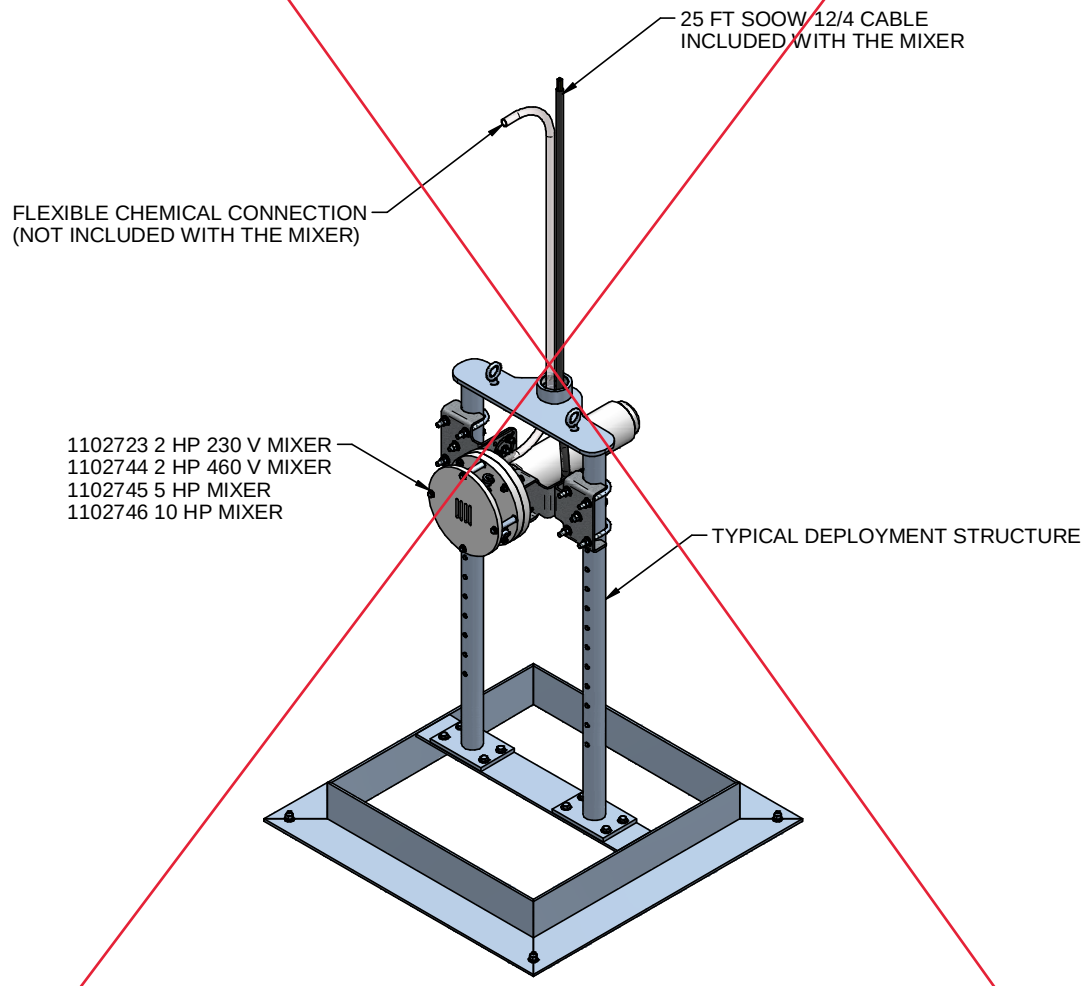
System Components

Figure 2



Layout Drawing

Figure 3



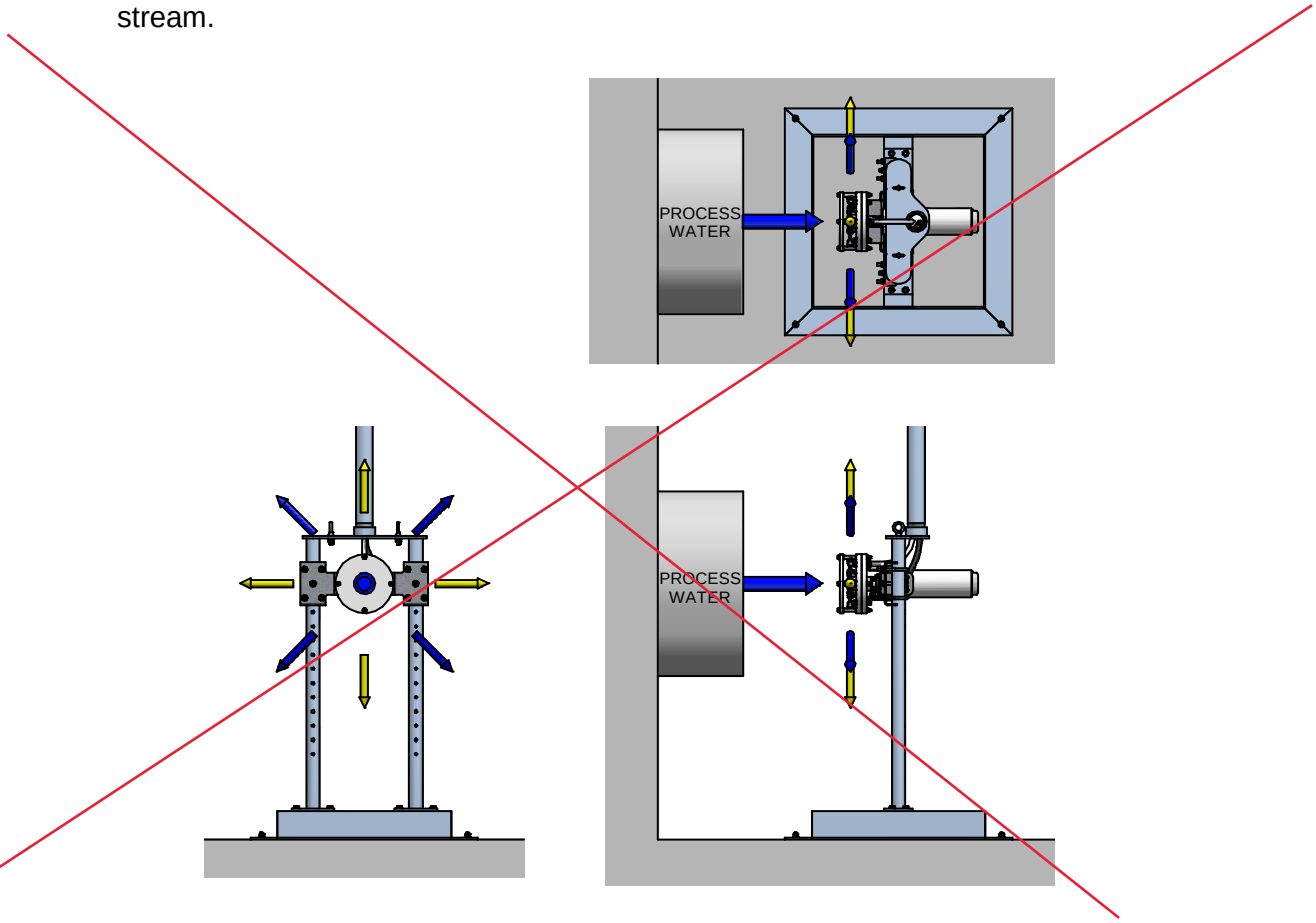
Installation

Unpacking

- Inspect the packaging of your ProMix SMS for any damage in shipment, and report it to the shipping company immediately, as shipping damage is not warranted by ProMinent.
- Check your goods against the packing list and purchase order to be sure you have received your entire order. If there is anything missing, contact your ProMinent distributor.

Location

- The ProMix SMS is placed into the process stream. It should be centered with the inlet pipe/channel, with the mixer facing into the process flow, to properly disperse the chemical across the entire inlet stream.
- A winch should be installed for installing/removing the ProMix SMS from the process stream.



Electrical Installation

IMPORTANT

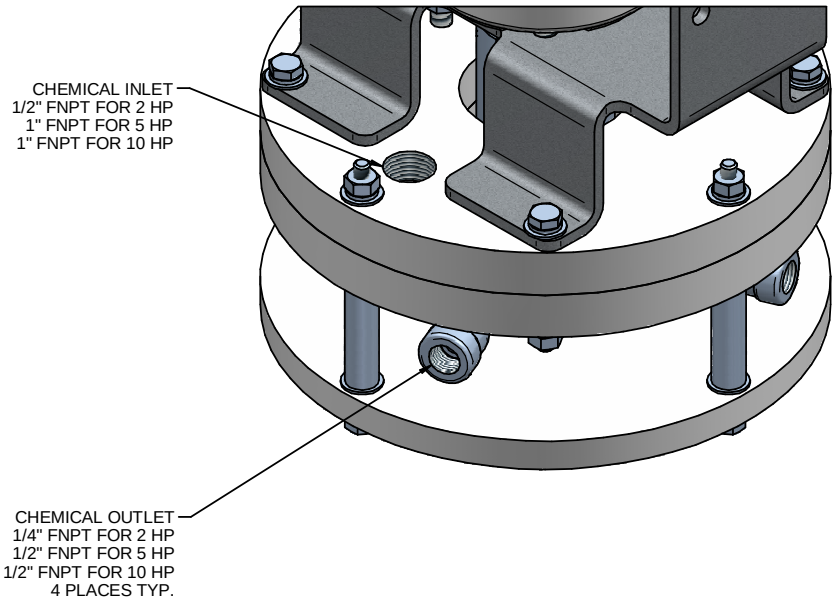
- ***Observe all local state and national electrical codes when installing your ProMix SMS.***
- ***The electrical installation of the system should only be performed by qualified electricians.***

- The ProMix SMS utilizes a 3 phase motor which will turn CW or CCW depending on how the phases are connected. 5 HP and 10 HP models include a SubMonitor motor protection device in the control panel door which will indicate if phase reversal is required when powered for the first time. The 2 HP ProMix SMS is designed to work equally well in either direction, rotation verification is not required.
- The ProMix SMS is electrically connected according to the enclosed electrical diagram (see Appendix for drawing). Make sure that the ProMix SMS is grounded per all applicable electrical codes to prevent electrical shock.

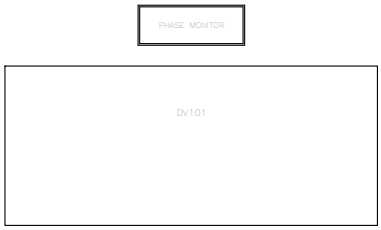
  NOTE: *If electrical drawings were provided with your ProMix SMS, they supersede the drawings in this manual.*

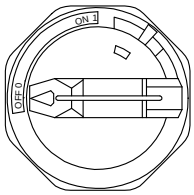
Chemical connection

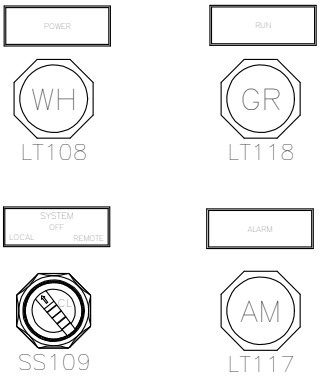
- The chemical connection is located on the motor side of the plenum. Use a flexible connection here to make installing and removing the mixer easier.
- ~~2 HP model has ½" FNPT connection~~
- 5 and 10 HP models have a 1" FNPT connection.



Description of System Control Panel







Power Disconnect Switch

The disconnect switch is located in the upper right hand corner of the control panel. This switch is used to remove the supply power while service or maintenance is being performed.

POWER light

The POWER light will illuminate to indicate that power is connected and the safety disconnect switch is in the LOCAL position.

RUN light

The RUN light will illuminate to indicate the mixer motor is spinning.

ALARM light

The ALARM light will illuminate to indicate a tripped motor protection device. Check the motor starter and reset if needed.

LOCAL OFF REMOTE switch

LOCAL: The mixer will run with controls provided at the panel.

OFF: The mixer will not run.

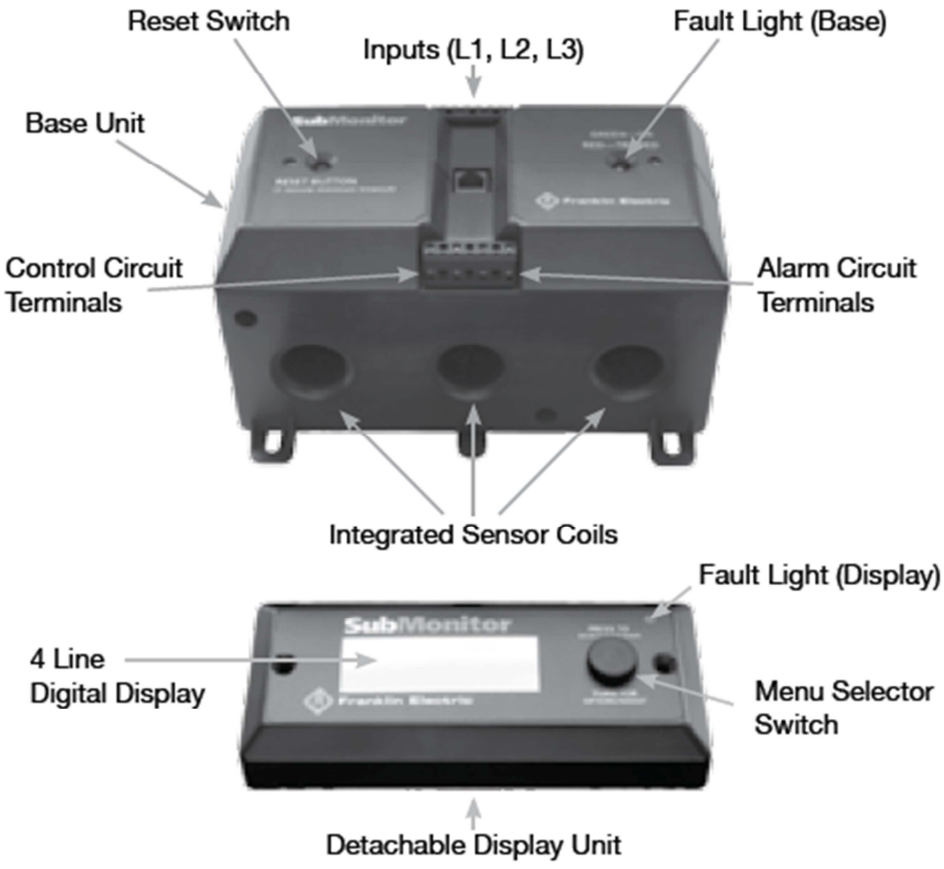
REMOTE: The mixer will respond to a remote switch/contact to operate. The mixer will run when the remote switch is closed.

SUBMONITOR motor protection (not available for the 2 HP model)

The ProMix SMS is designed utilizing a motor protection device to ensure long motor life. This monitor will be pre-programmed for your mixer prior to shipment. The entire manual for this monitor is included in this manual as an appendix.

SubMonitor

Components



SubMonitor Submersible Pump Motor Protection System

Franklin's SubMonitor is an easy to use, programmable protection device for Franklin Electric three-phase submersible motors.

SubMonitor's features provide advanced protection of submersible motors:

- SubMonitor operates over the full range of three-phase motor voltages, 200 - 575 volts, 50 and 60 Hz.
- Operates on motors with service factor current rating of 5 amps through 350 amps - no external current transformers required.
- Protects motors and pumps from overloads, underloads, overvoltage, undervoltage, unbalanced currents, phase loss*, chattering contacts, and phase reversal.
- Operates with a Subtrol-equipped submersible motor to provide motor winding overheat protection.
- Monitors and displays three-phase voltages, three-phase currents, and pump status.
- When a fault occurs, displays the fault conditions and status.
- Records and displays the history of up to 502 fault trip events, plus records changes to programmable parameters.
- Records total pump operating time.
- Features a detachable display unit which may be mounted on the front of a panel for viewing operating status.
- Includes the option of password protection to avoid tampering.
- Easy mounting with DIN rail mounts.
- Totally integrated unit - current transformers are built in.

Simple Programming

SubMonitor has been pre-programmed with default settings for submersible motors and pumps. Set-up is as simple as setting the motor ratings - voltage, Hertz, and SF max amps.

Additional programming options can be selected if desired to customize the features and levels of protection. See page 7 for an overview of the menu structure and page 12 for a full list of programmable options.

All programming set-up can be made prior to installing at the field site by connecting 230 volts single-phase between voltage inputs L1, L2 and L3 of SubMonitor (jumper between L2 and L3) and entering the motor data and any other options.

* Phase loss is a severe case of current unbalance. Reported unbalance trips are due to phase loss when current on one of the legs (noted in the data log) is very small, or when the current unbalance function has been disabled.

Other Features

Reset

The SubMonitor will not allow a reset for several minutes after a fault trip, depending on the programmed reset time and fault mode. This allows time for the motor to cool before it is restarted after a problem has occurred. Any Manual Reset causes the motor to restart in exactly one minute.

Operation without the Display Unit

After the `Select Motor` parameters are entered (volts, Hz, and SF Amps), the base unit of SubMonitor provides full motor protection even when the Display Unit is disconnected.

When operating with a Base Unit only:

- A "run enable" condition is indicated by a green LED
- A trip condition is indicated by a red Fault LED
- Manual reset is initiated by pressing the Reset Switch
- The Event History is not recorded (total run time is recorded).

Special Conditions

Note: The SubMonitor **is not** compatible with variable frequency drives, electronic phase converters, or solid state soft starters. These devices will cause nuisance tripping of the motor overheat fault, or may cause damage to SubMonitor components.

Reduced voltage starters may be used with SubMonitor if they are bypassed during normal running condition (Figure 5), and if the starting time does not exceed 3 seconds.

Power Factor or Surge Capacitor— across-the-line capacitors for either power factor correction or surge protection may be used with SubMonitor. If used, these capacitors must be connected to the power supply lines before these lines pass through the SubMonitor sensor coil windows or motor overheat protection may be lost.

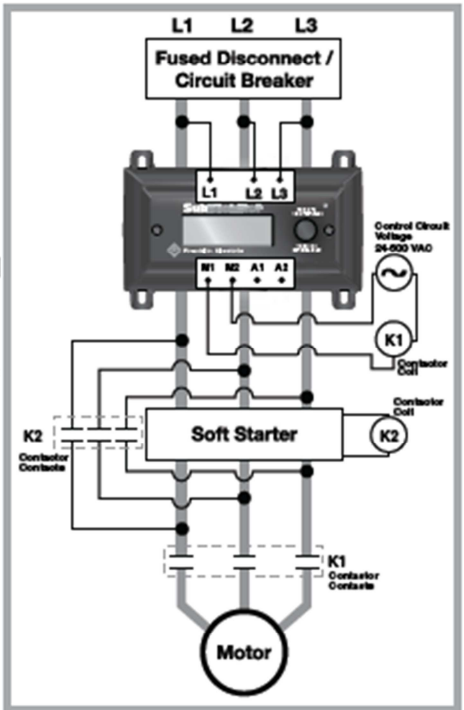


FIGURE 5

Note: At installations where the line voltage is typically 100 to 110% of nominal, it may be necessary to increase the default underload trip setting to fully protect the system against underload conditions.

Commissioning/Start Up/Operation

DANGER! ***This mixer has rotating parts, do not operate while anyone is within 5 feet of the mixing blades.***

Do not operate mixer above water, mixer must be submerged.

The ProMix SMS is a submersible mixer designed to disperse liquid chemical into a process stream. The chemical is metered to the mixer at the desired rate, and the ProMix SMS will effectively disperse it across the process stream.

- Connect supply power to the control panel.
- The ProMix SMS utilizes a 3 phase motor which will turn CW or CCW depending on how the phases are connected. 5 HP and 10 HP models include a SubMonitor motor protection device in the control panel door which will indicate if phase reversal is required when powered for the first time. The 2 HP ProMix SMS is designed to work equally well in either direction, rotation verification is not required.
- Verify the safety disconnect is OFF. Connect the mixer motor leads to the control panel according to the electrical drawings.
- Verify all internal breakers are in the ON position.
- Once control panel door is closed, turn the disconnect switch to the ON position. POWER light should illuminate.
- Connect the chemical supply plumbing.
- Place the ProMix SMS into the process stream. It should be centered with the inlet pipe/channel, with the mixer facing into the process flow, to properly disperse the chemical across the entire inlet stream.
- The motor must be covered by water.

The ProMix SMS can be started by placing the selector switch to the LOCAL position or by closing a remote switch/contact in the REMOTE position. The chemical delivery pump can now be started, allowing the ProMix SMS to disperse the chemical into the process stream. A typical installation would be to utilize the REMOTE operation and interlock the mixer with the chemical feed pump such that both start/stop at the same time.

Maintenance/Troubleshooting

The ProMix SMS does not require any regularly scheduled maintenance. The below is for an "as needed" basis.

Tightening the motor lead connector jam nut

- A motor lead assembly should not be reused. A new lead assembly should be used whenever one is removed from the motor.
- Jam nut tightening torques recommended for field assembly are shown below.

2 HP ProMix SMS	15-20 ft-lbs (20-27Nm)
5 HP ProMix SMS	40-50 ft-lbs (54-68Nm)
10 HP ProMix SMS	40-50 ft-lbs (54-68Nm)

Shaft height and free end play

- When the motor is vertical, the height of the shaft, measured from the motor face, can indicate the amount of wear of the thrust bearing. If the height is low or if there is excessive end play, this may indicate the thrust bearing is damaged and should be replaced.

Model	Normal shaft height	Free end play
2 HP	1.498-1.508" (38.05-38.30 mm)	.010-.045" (.25-1.14 mm)
5 HP	2.869-2.875" (72.88-73.02 mm)	.030-.050" (.76-1.27 mm)
10 HP	2.869-2.875" (72.88-73.02 mm)	.030-.050" (.76-1.27 mm)

Motor winding resistance

Measuring the resistance of the motor windings will give an indication of open or shorted windings. The ohms should be read from lead to lead and be within the below range.

Model	Acceptable range in Ohms
2 HP	9.2-12
5 HP	3.6-4.4
10 HP	1.8-2.3

The above ranges are for 460V motors. Consult factory for other voltage motors.

Replace the motor if the readings are outside the listed range.

Motor winding insulation

Motor winding insulation integrity can be measured utilizing a megohm meter. The below values are based utilizing a 500VDC output megohm meter. The insulation readings vary little between different HP models so all models will have very similar insulation resistance.

Motor condition	Insulation resistance
New motor	2 megohm or higher
Acceptable	.5-2 megohm
Insulation damage	<.5 megohm, needs repair

Please note these measurements should be taken on the motor only, do not include the power cord.

Troubleshooting

Mixer won't start

Possible Cause	Checking procedure	Corrective Action
No power	Verify voltage on incoming power. Must be within 10% of rated voltage	If no power, check for upstream circuit breaker
Control switch in wrong position	Check control switch. Mixer should run when placed in ON position. REMOTE position requires a remote control switch.	Place control switch in correct position.
Circuit breaker tripped	Check breaker in mixer control panel.	Reset breaker if needed. Check motor if this problem persists.
Defective wiring/Defective motor	Check for loose or corroded connections.	Correct faulty wiring or connections. Check motor.

Mixer starts but overload trips

Possible Cause	Checking procedure	Corrective Action
Incorrect voltage	Measure voltage while under load. Voltage must be within 10% of rated voltage.	If voltage is low, check upstream transformer.
Defective wiring	Check for loose or corroded connections.	Correct faulty wiring or connections.
Motor overload set incorrectly	Verify trip setting on overload relay.	Adjust trip set point if needed.
Defective motor	Measure operating amperage.	Replace motor if needed.

Specifications

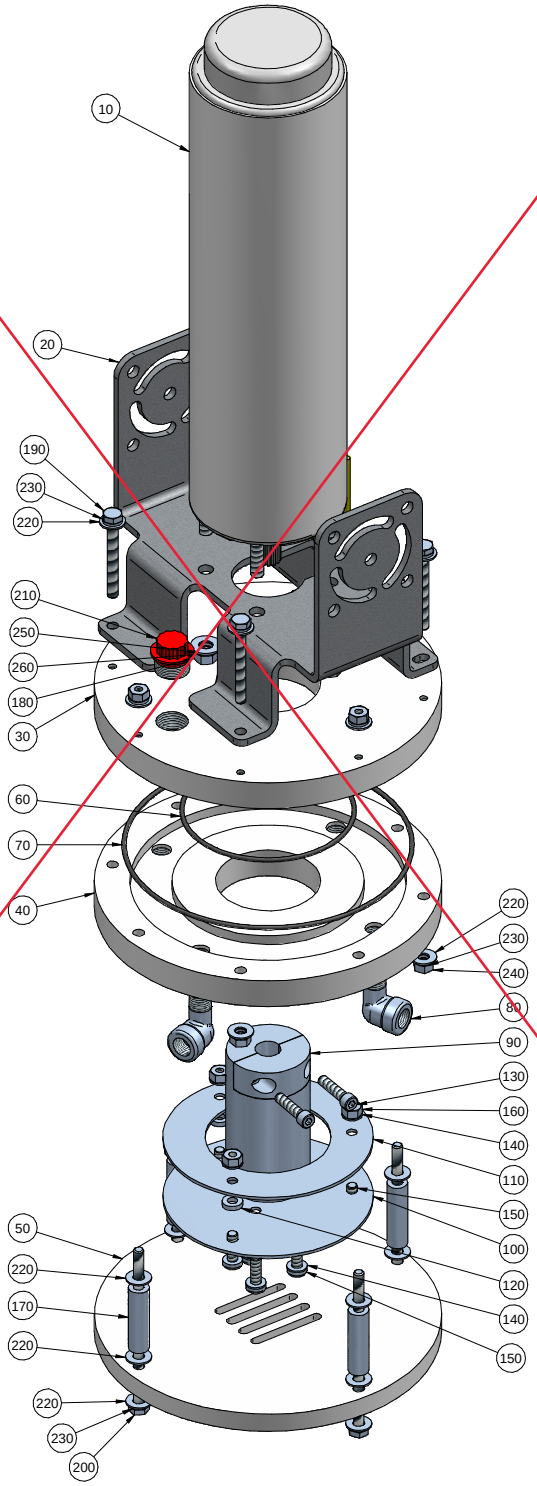
The standard ProMix SMS systems are offered in 460 VAC, 3 phase, 60 Hz. Other voltages/frequencies are available on request. Please consult factory.

The amperages listed below are for 460VAC, 3 phase, 60 Hz models.

Model	Full Load Amps	Maximum Amps
2 HP	3.4	4.1
5 HP	7.5	8.8
10 HP	14.2	16.1

Appendix

1102723 2 HP, 230 V, MIXER EXPLODED VIEW



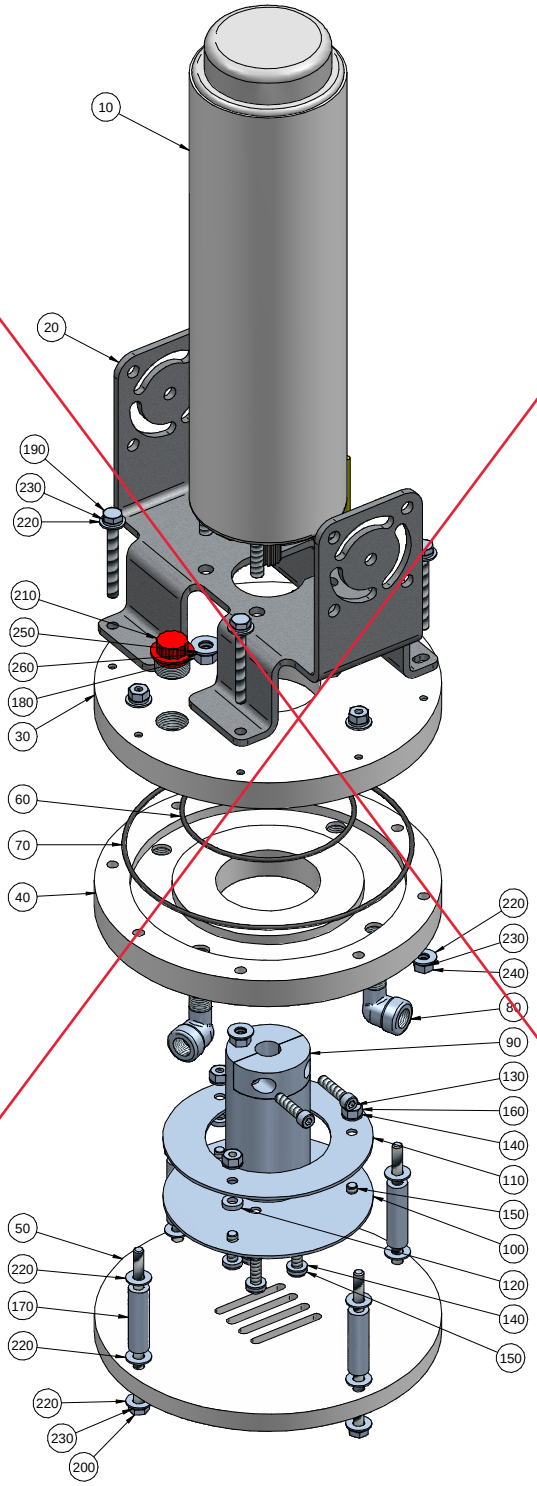
Appendix

1102723 2 HP, 230 V, MIXER BILL OF MATERIALS

ITEM #	USA P\N	QTY.	UN	SAP	DESCRIPTION
10	1080781	1	EA	L	MOTOR, SUBMERSIBLE, 2HP, 4", NEMA, 3PH, 230V
20	1080765	1	EA	L	BRACKET, MOTOR MOUNTING, 2HP, PROMIX SMS
30	1080748	1	EA	L	PLENUM, UPPER, 2 HP, PROMIX SMS
40	1102455	1	EA	L	PLENUM, LOWER, 2 HP, SE PROMIX SMS
50	1102456	1	EA	L	GUARD, BLADE, 2 HP, SE PROMIX SMS
60	1080790	1	EA	L	O-RING, 3/32" X 3.987 ID, AS 568-155, VITON
70	1080791	1	EA	L	O-RING, 3/32" X 6.737 ID, AS 568-166, VITON
80	1102467	4	EA	L	ELBOW, STREET, 1/4", FNPT X MNPT, GRADE 4 TITANIUM, 150 #
90	1102459	1	EA	L	HUB, BLADE, 4" SUBMERSIBLE MOTOR, TI, SE, PROMIX SMS
100	1102461	1	EA	L	BLADE, BASE, 5.0" DIAMETER, 2HP, RV, PROMIX SMS
110	1080827	1	EA	L	BLADE, MIXING, 5.0" DIAMETER, 2HP, RV, PROMIX SMS
120	1080736	3	EA	L	SPACER, 1/2" OD, 1/4" ID, 1/8" THICK, TITANIUM
130	1102469	2	EA	L	SCREW, 1/4-20 X 1", TITANIUM, SOCKET HEAD CAP, TORX
140	1080762	6	EA	L	WASHER, LOCK, 1/4", TI
150	1080763	6	EA	L	SCREW, 1/4-20 X 3/4", TITANIUM, TORX PAN HEAD
160	1080761	3	EA	L	NUT, 1/4-20, TI
170	1102472	4	EA	L	SPACER, 1/2" OD, 1/4" ID, 1-3/4" LONG, 316
180	1080796	4	EA	L	NUT, 5/16-24, 316 SST
190	1080794	4	EA	L	BOLT, 1/4-20 X 2-1/4", 316 SST, FULLY THREADED
200	1102470	4	EA	L	BOLT, 1/4-20 X 4-1/2", 316 SST, FULLY THREADED
210	7744688	1	EA	L	CAP PLUG, 1/2",
220	STOCK	24	EA	L	WASHER, FLAT, 1/4", 316 SST
230	STOCK	16	EA	L	WASHER, LOCK, 1/4", 316 SST
240	STOCK	8	EA	L	NUT, 1/4-20, 316 SST
250	STOCK	4	EA	L	WASHER, FLAT, 5/16", 316 SST
260	STOCK	4	EA	L	WASHER, LOCK, 5/16", 316 SST

Appendix

1102744 2 HP, 460 V, MIXER EXPLODED VIEW



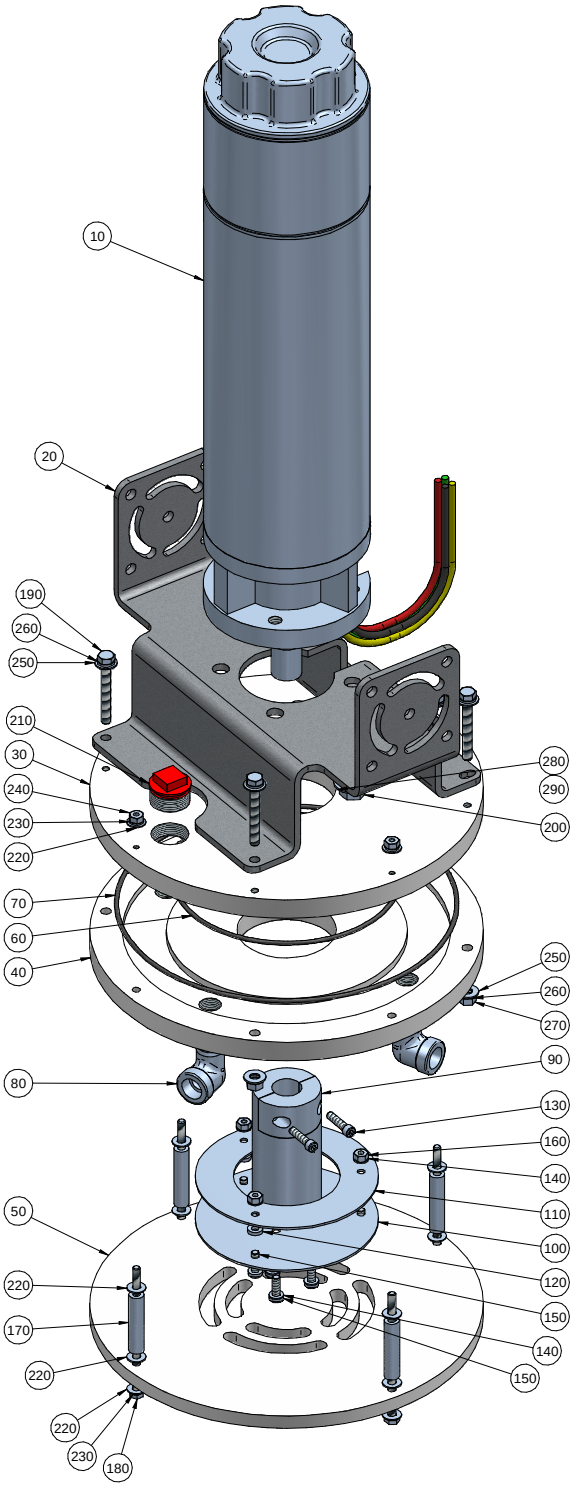
Appendix

1102744 2 HP, 460 V, MIXER BILL OF MATERIALS

ITEM #	USA P\N	QTY.	UN	SAP	DESCRIPTION
10	1102466	1	EA	L	MOTOR, SUBMERSIBLE, 2HP, 4", NEMA, 3PH, 460V
20	1080765	1	EA	L	BRACKET, MOTOR MOUNTING, 2HP, PROMIX SMS
30	1080748	1	EA	L	PLENUM, UPPER, 2 HP, PROMIX SMS
40	1102455	1	EA	L	PLENUM, LOWER, 2 HP, SE PROMIX SMS
50	1102456	1	EA	L	GUARD, BLADE, 2 HP, SE PROMIX SMS
60	1080790	1	EA	L	O-RING, 3/32" X 3.987 ID, AS 568-155, VITON
70	1080791	1	EA	L	O-RING, 3/32" X 6.737 ID, AS 568-166, VITON
80	1102467	4	EA	L	ELBOW, STREET, 1/4", FNPT X MNPT, GRADE 4 TITANIUM, 150 #
90	1102459	1	EA	L	HUB, BLADE, 4" SUBMERSIBLE MOTOR, TI, SE, PROMIX SMS
100	1102461	1	EA	L	BLADE, BASE, 5.0" DIAMETER, 2HP, RV, PROMIX SMS
110	1080827	1	EA	L	BLADE, MIXING, 5.0" DIAMETER, 2HP, RV, PROMIX SMS
120	1080736	3	EA	L	SPACER, 1/2" OD, 1/4" ID, 1/8" THICK, TITANIUM
130	1102469	2	EA	L	SCREW, 1/4-20 X 1", TITANIUM, SOCKET HEAD CAP, TORX
140	1080762	6	EA	L	WASHER, LOCK, 1/4", TI
150	1080763	6	EA	L	SCREW, 1/4-20 X 3/4", TITANIUM, TORX PAN HEAD
160	1080761	3	EA	L	NUT, 1/4-20, TI
170	1102472	4	EA	L	SPACER, 1/2" OD, 1/4" ID, 1-3/4" LONG, 316
180	1080796	4	EA	L	NUT, 5/16-24, 316 SST
190	1080794	4	EA	L	BOLT, 1/4-20 X 2-1/4", 316 SST, FULLY THREADED
200	1102470	4	EA	L	BOLT, 1/4-20 X 4-1/2", 316 SST, FULLY THREADED
210	7744688	1	EA	L	CAP PLUG, 1/2",
220	STOCK	24	EA	L	WASHER, FLAT, 1/4", 316 SST
230	STOCK	16	EA	L	WASHER, LOCK, 1/4", 316 SST
240	STOCK	8	EA	L	NUT, 1/4-20, 316 SST
250	STOCK	4	EA	L	WASHER, FLAT, 5/16", 316 SST
260	STOCK	4	EA	L	WASHER, LOCK, 5/16", 316 SST

Appendix

1102745 5 HP, 460 V, MIXER EXPLODED VIEW

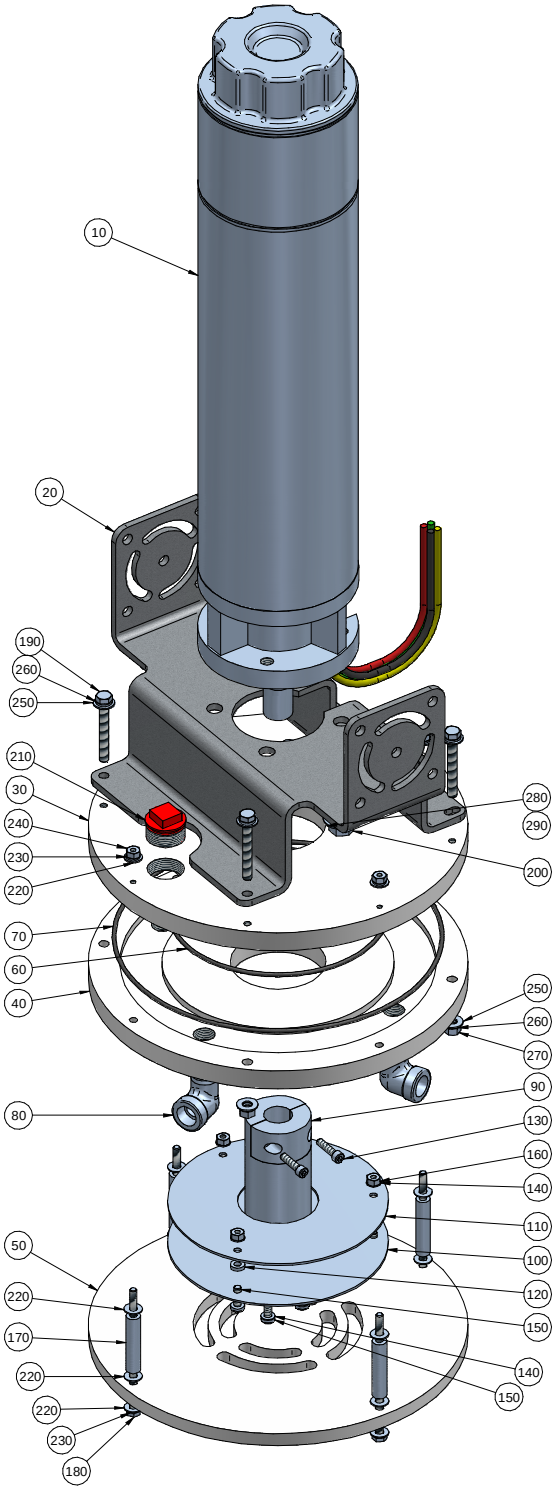


1102745 5 HP, 460 V, MIXER BILL OF MATERIALS

ITEM #	USA P\N	QTY.	UN	SAP	DESCRIPTION
10	1080782	1	EA	L	MOTOR, SUBMERSIBLE, 5HP, 6", NEMA, 3PH, 460V
20	1080768	1	EA	L	BRACKET, MOTOR MOUNTING, 5/10HP, PROMIX SMS
30	1080751	1	EA	L	PLENUM, UPPER, 5/10 HP. PROMIX SMS
40	1102457	1	EA	L	PLENUM, LOWER, 5/10 HP. SE PROMIX SMS
50	1102458	1	EA	L	GUARD, BLADE, 5/10 HP, SE PROMIX SMS
60	1080792	1	EA	L	O-RING, 1/8" X 7.234 ID, AS 568-263, VITON
70	1080793	1	EA	L	O-RING, 1/8" X 10.984 ID, AS 568-276, VITON
80	1102468	4	EA	L	ELBOW, STREET, 1/2", FNPT X MNPT, GRADE 4 TITANIUM, 150 #
90	1102460	1	EA	L	HUB, BLADE, 6" SUBMERSIBLE MOTOR, TI, SE, PROMIX SMS
100	1102462	1	EA	L	BLADE, BASE, 6" DIAMETER, 5 HP, RV, PROMIX SMS
110	1102463	1	EA	L	BLADE, MIXING, 6" DIAMETER, 5 HP, RV, PROMIX SMS
120	1080736	3	EA	L	SPACER, 1/2" OD, 1/4" ID, 1/8" THICK, TITANIUM
130	1102469	2	EA	L	SCREW, 1/4-20 X 1", TITANIUM, SOCKET HEAD CAP, TORX
140	1080762	6	EA	L	WASHER, LOCK, 1/4", TI
150	1080763	6	EA	L	SCREW, 1/4-20 X 3/4", TITANIUM, TORX PAN HEAD
160	1080761	3	EA	L	NUT, 1/4-20, TI
170	1102473	4	EA	L	SPACER, 1/2" OD, 1/4" ID, 2-1/4" LONG, 316
180	1102471	4	EA	L	BOLT, 1/4-20 X 5", 316 SST, FULLY THREADED
190	1080795	4	EA	L	BOLT, 5/16-18 X 2-1/2", 316 SST, FULLY THREADED
200	1080858	4	EA	L	BOLT, 1/2-20 X 1-1/2", 316 SST
210	7744690	1	EA	L	CAP PLUG, 1",
220	STOCK	16	EA	L	WASHER, FLAT, 1/4", 316 SST
230	STOCK	8	EA	L	WASHER, LOCK, 1/4", 316 SST
240	STOCK	4	EA	L	NUT, 1/4-20, 316 SST
250	STOCK	8	EA	L	WASHER, FLAT, 5/16", 316 SST
260	STOCK	8	EA	L	WASHER, LOCK, 5/16", 316 SST
270	STOCK	4	EA	L	NUT, 5/16-18, 316 SST
280	STOCK	4	EA	L	WASHER, FLAT, 1/2", 316 SST
290*	STOCK	4	EA	L	WASHER, LOCK, 1/2", 316 SST

Appendix

1102746 10 HP, 460 V, MIXER EXPLODED VIEW



1102746 10 HP, 460 V, MIXER BILL OF MATERIALS

ITEM #	USA P\N	QTY.	UN	SAP	DESCRIPTION
10	1080783	1	EA	L	MOTOR, SUBMERSIBLE, 10HP, 6", NEMA, 3PH, 460V
20	1080768	1	EA	L	BRACKET, MOTOR MOUNTING, 5/10HP, PROMIX SMS
30	1080751	1	EA	L	PLENUM, UPPER, 5/10 HP. PROMIX SMS
40	1102457	1	EA	L	PLENUM, LOWER, 5/10 HP. SE PROMIX SMS
50	1102458	1	EA	L	GUARD, BLADE, 5/10 HP, SE PROMIX SMS
60	1080792	1	EA	L	O-RING, 1/8" X 7.234 ID, AS 568-263, VITON
70	1080793	1	EA	L	O-RING, 1/8" X 10.984 ID, AS 568-276, VITON
80	1102468	4	EA	L	ELBOW, STREET, 1/2", FNPT X MNPT, GRADE 4 TITANIUM, 150 #
90	1102460	1	EA	L	HUB, BLADE, 6" SUBMERSIBLE MOTOR, TI, SE, PROMIX SMS
100	1102464	1	EA	L	BLADE, BASE, 7.5" DIAMETER, 10 HP, RV, PROMIX SMS
110	1102465	1	EA	L	BLADE, MIXING, 7.5" DIAMETER, 10 HP, RV, PROMIX SMS
120	1080736	3	EA	L	SPACER, 1/2" OD, 1/4" ID, 1/8" THICK, TITANIUM
130	1102469	2	EA	L	SCREW, 1/4-20 X 1", TITANIUM, SOCKET HEAD CAP, TORX
140	1080762	6	EA	L	WASHER, LOCK, 1/4", TI
150	1080763	6	EA	L	SCREW, 1/4-20 X 3/4", TITANIUM, TORX PAN HEAD
160	1080761	3	EA	L	NUT, 1/4-20, TI
170	1102473	4	EA	L	SPACER, 1/2" OD, 1/4" ID, 2-1/4" LONG, 316
180	1102471	4	EA	L	BOLT, 1/4-20 X 5", 316 SST, FULLY THREADED
190	1080795	4	EA	L	BOLT, 5/16-18 X 2-1/2", 316 SST, FULLY THREADED
200	1080858	4	EA	L	BOLT, 1/2-20 X 1-1/2", 316 SST
210	7744690	1	EA	L	CAP PLUG, 1",
220	STOCK	16	EA	L	WASHER, FLAT, 1/4", 316 SST
230	STOCK	8	EA	L	WASHER, LOCK, 1/4", 316 SST
240	STOCK	4	EA	L	NUT, 1/4-20, 316 SST
250	STOCK	8	EA	L	WASHER, FLAT, 5/16", 316 SST
260	STOCK	8	EA	L	WASHER, LOCK, 5/16", 316 SST
270	STOCK	4	EA	L	NUT, 5/16-18, 316 SST
280	STOCK	4	EA	L	WASHER, FLAT, 1/2", 316 SST
290*	STOCK	4	EA	L	WASHER, LOCK, 1/2", 316 SST

2.3

6" SUBMERSIBLE MOTORS

These motors are built for dependable operation in 6" diameter or larger water wells.

BASIC FEATURES

- Double flanged NEMA mounting design
- Stainless steel splined shaft
- StatorShield™, Franklin's six-feature encapsulation system
- High-capacity, Kingsbury-type, water-lubricated thrust bearing
- Factory-filled with Franklin's non-toxic water soluble fill solution
- Field replaceable lead using Franklin's exclusive Water-Bloc™ technology
- Full 3,450 rpm 60 Hz design point
- External sand slinger on shaft
- Mechanical face seal at shaft exit
- Copper bar rotor
- All models variable frequency drive (VFD) compatible
- Single-phase models must be used with a Franklin Electric control box

SPECIAL FEATURES

- Sand Fighter™ and 316 stainless steel models are equipped with Franklin's exclusive Sand Fighter™ sealing system for sand or other abrasives, as well as Franklin's exclusive on-winding SubTrol™ heat sensor for use with SubMonitor™
- Consult factory for other voltage, hertz, and horsepower ratings not listed in this catalog
- Specifications are subject to change without notice; contact Franklin Electric if current materials are required for bid specifications
- Overmolded motor leads on all 10 GA leads

6" SUBMERSIBLE MOTORS - SPECIFICATIONS AND MATERIALS

MOTOR SPECIFICATIONS

Hz	Model	Phase	HP Range	kW Range	Poles	RPM	Max. Ambient Temp.	Duty Rating
50	Standard*	1	5 - 15	3.7 - 11	2	2875	86 °F / 30 °C	Continuous*
50		3	5 - 40	3.7 - 45			86 °F / 30 °C	
50		3	50 - 60	37 - 45			122 °F / 50 °C	
50	High-Temp 90°C**	3	5 - 40	3.7 - 30			195 °F / 90 °C	
60		1	5 - 15	3.7 - 11		3450	86 °F / 30 °C	
60	Standard*	3	5 - 40	3.7 - 30			86 °F / 30 °C	
60		3	50 - 60	37 - 45			122 °F / 50 °C	
60	High-Temp 90°C**	3	5 - 40	3.7 - 30			195 °F / 90 °C	

**At 0.5 ft/sec flow past motor; motors are rated for continuous duty up to 86°F (30 °C) water temperature*

***At 0.5 ft/sec flow past motor, motors are rated for continuous duty up to 195°F (90 °C) water temperature and up to 86 °F (30 °C) water temperature with NO FLOW in lakes or in wells 12 inches or larger in diameter.*

CONSTRUCTION MATERIALS

Component	Construction Type				
	Standard Water Well	Sand Fighter™	Corrosion Resistant (316 SS)	Hi-Temp 90°C (300 SS Shell)	Hi-Temp 90°C (316 SS)
UL Insulation Class Rating	Class F	Per standard water well	Per standard water well	Class F	Class F
Motor Ambient Temp. Rating	86 °F / 30 °C (5-40 hp) 122 °F / 50 °C (50-60 hp)			194 °F / 90 °C (5-40 hp)	194 °F / 90 °C (5-40 hp)
Stator Resin Type	Standard (5-40 hp) / Hi-Temp (50-60 hp)			FE Hi-Temp	FE Hi-Temp
Motor Fill Solution (Water Soluble/Non-Toxic)	FES91			FES92	FES92
Top End Bell & Thrust Housing	Epoxy-coated gray iron		316 SS	Epoxy-coated gray iron	316 SS
On Winding SubTrol™ heat sensor	No (5-40 hp) / Yes (50-60 hp)	Yes	Yes	Not Available	Not Available
Stator Shell	300 series SS	Per standard water well	316 SS	300 series SS	316 SS
Stator Ends	Carbon steel			Carbon steel	316 SS
Shaft Extension	300 Series SS (5-30 hp) / 17-4 SS (40-60 hp)		17-4 SS	300 SS (5-20 hp), 17-4 SS (25-40 hp)	17-4 SS
Bushing	Bronze		316 SS	Bronze	316 SS
Bushing Retainer	300 series SS			300 series SS	316 SS
Shaft Mechanical Seal	Carbon ceramic (5-40 hp) Sand Fighter™ Seal System (50-60 hp)	Sand Fighter™ Seal System	Sand Fighter™ Seal System	Sand Fighter™ Seal System	Sand Fighter™ Seal System
Mechanical Seal / Rubber Components	Nitrile (5-40 hp) / FKM (50-60 hp)	Per standard water well	Per standard water well	FKM	FKM
Diaphragm Material	Nitrile (5-40 hp) / FKM (50-60 hp)			FKM	FKM
Diaphragm Plate	300 series SS		316 SS	300 series SS	316 SS
Diaphragm Spring	300 series SS		25-6 MO SS	300 series SS	25-6 MO SS
Shaft Slinger	Nitrile (5-40 hp) / FKM (50-60 hp)		Nitrile	FKM	FKM
Lead Wire	Overmolded		Per standard water well	XLPO	XLPO
Lead Potting	Epoxy			Epoxy	Epoxy
Lead Jam Nut	Brass		316 SS	Brass	316 SS
Thrust Bearing Rating (86 °F / 30 °C)	3500 lbs (5-30 hp) 6000 lbs (40-60 hp)		Per standard water well	Standard 5-20 hp • 4,500 lbs Standard 25-40 hp • 7,500 lbs	Standard 5-20 hp • 4,500 lbs Standard 25-40 hp • 7,500 lbs
Method Of Connecting System Ground To Motor	Ground wire in power lead connector			Ground wire in power lead connector	Ground wire in power lead connector

NOTE: Specifications subject to change without notice; contact Franklin Electric if current material types are required for bid specifications

6" SUBMERSIBLE MOTORS - ORDERING INFORMATION

SINGLE-PHASE MODELS

HP	Description	Volts	Hz	S.F.	Motor Lead	Model No.	In Stock	Thrust Rating	Wt. (lbs)
5	Water Well	230	60	1.15	DOL (3)	2261109020	Yes	3500	110
	Sand Fighter™	230	60	1.15	DOL (3)	2261108020	Yes	3500	110
	316 SS	230	60	1.15	DOL (3)	2261103920	-	3500	110
7.5	Water Well	230	60	1.15	DOL (3)	2261119020	Yes	3500	123
	Sand Fighter™	230	60	1.15	DOL (3)	2261118020	Yes	3500	123
	316 SS	230	60	1.15	DOL (3)	2261113920	-	3500	123
10	Water Well	230	60	1.15	DOL (3)	2261129020	Yes	3500	141
	Sand Fighter™	230	60	1.15	DOL (3)	2261128020	Yes	3500	141
	316 SS	230	60	1.15	DOL (3)	2261123920	-	3500	141
15	Water Well	230	60	1.15	DOL (3)	2261139020	Yes	3500	154
	Sand Fighter™	230	60	1.15	DOL (3)	2261138020	Yes	3500	154
	316 SS	230	60	1.15	DOL (3)	2261133920	-	3500	154

THREE-PHASE MODELS

HP	Description	Volts	Hz	S.F.	Motor Lead	Model No.	In Stock	Thrust Rating	Wt. (lbs)
5	Water Well	200	60	1.15	DOL (3)	2366509020	Yes	3500	101
		220	50	1.0	DOL (3)	2366809020	-	3500	101
		230	60	1.15	DOL (3)	2366009020	Yes	3500	101
		230	60	1.15	Y-Δ (6)	2367209020	-	3500	106
		380	60	1.15	DOL (3)	2366609020	-	3500	101
		380	60	1.15	Y-Δ (6)	2367809020	-	3500	106
		415	50	1.0	DOL (3)	2366909020	-	3500	101
		460/380	60/50	1.15/1.0	DOL (3)	2366109020	Yes	3500	101
		460/380	60/50	1.15/1.0	Y-Δ (6)	2367109020	-	3500	106
		575	60	1.15	DOL (3)	2366209020	-	3500	101
	Sand Fighter™	200	60	1.15	DOL (3)	2366508120	Yes	3500	101
		220	50	1.0	DOL (3)	2366808120	-	3500	101
		230	60	1.15	DOL (3)	2366008120	Yes	3500	101
		380	60	1.15	DOL (3)	2366608120	-	3500	101
		460/380	60/50	1.15/1.0	DOL (3)	2366108120	Yes	3500	101
		460/380	60/50	1.15/1.0	Y-Δ (6)	2367108120	-	3500	106
		575	60	1.15	DOL (3)	2366208120	Yes	3500	101
	316 SS w/SubTrol™	200	60	1.15	DOL (3)	2366504020	-	3500	101
		230	60	1.15	DOL (3)	2366004020	Yes	3500	101
		380	60	1.15	DOL (3)	2366604020	-	3500	101
		460/380	60/50	1.15/1.0	DOL (3)	2366104020	Yes	3500	101
		460/380	60/50	1.15/1.0	Y-Δ (6)	2367104020	-	3500	106
		575	60	1.15	DOL (3)	2366204020	-	3500	101
	Hi-Temp 90°C	200	60	1.15	DOL (3)	2766500003	-	4500	116
		230	60	1.15	DOL (3)	2766000003	-	4500	116
		380	60	1.15	DOL (3)	2766600003	-	4500	116
		460/380	60/50	1.15/1.0	DOL (3)	2766100003	-	4500	116
		460/380	60/50	1.15/1.0	Y-Δ (6)	2767100003	-	4500	121
		575	60	1.15	DOL (3)	2766200003	-	4500	116
	Hi-Temp 90°C - 316 SS	200	60	1.15	DOL (3)	2766503003	-	4500	116
		230	60	1.15	DOL (3)	2766003003	-	4500	116
		380	60	1.15	DOL (3)	2766603003	-	4500	116
		460/380	60/50	1.15/1.0	DOL (3)	2766103003	-	4500	116
		575	60	1.15	DOL (3)	2766203003	-	4500	116

6" SUBMERSIBLE MOTORS - ORDERING INFORMATION

THREE-PHASE MODELS

HP	Description	Volts	Hz	S.F.	Motor Lead	Model No.	In Stock	Thrust Rating	Wt. (lbs)
10	Water Well	200	60	1.15	DOL (3)	2366529020	Yes	3500	116
		220	50	1.0	DOL (3)	2366829020	-	3500	116
		230	60	1.15	DOL (3)	2366029020	Yes	3500	116
		230	60	1.15	Y-Δ (6)	2367229020	-	3500	121
		380	60	1.15	DOL (3)	2366629020	Yes	3500	116
		380	60	1.15	Y-Δ (6)	2367829020	-	3500	121
		415	50	1.0	DOL (3)	2366929020	-	3500	116
		460/380	60/50	1.15/1.0	DOL (3)	2366129020	Yes	3500	116
		460/380	60/50	1.15/1.0	Y-Δ (6)	2367129020	Yes	3500	121
		575	60	1.15	DOL (3)	2366229020	-	3500	116
	Sand Fighter™	200	60	1.15	DOL (3)	2366528120	Yes	3500	116
		220	50	1.0	DOL (3)	2366828120	-	3500	116
		230	60	1.15	DOL (3)	2366028120	Yes	3500	116
		380	60	1.15	DOL (3)	2366628120	-	3500	116
		415	50	1.0	DOL (3)	2366928120	-	3500	116
		460/380	60/50	1.15/1.0	DOL (3)	2366128120	Yes	3500	116
		460/380	60/50	1.15/1.0	Y-Δ (6)	2367128120	-	3500	121
		575	60	1.15	DOL (3)	2366228120	Yes	3500	116
	316 SS w/SubTrol™	200	60	1.15	DOL (3)	2366524020	-	3500	116
		230	60	1.15	DOL (3)	2366024020	Yes	3500	116
		380	60	1.15	DOL (3)	2366624020	-	3500	116
		460/380	60/50	1.15/1.0	DOL (3)	2366124020	Yes	3500	116
		460/380	60/50	1.15/1.0	Y-Δ (6)	2367124020	-	3500	121
		575	60	1.15	DOL (3)	2366224020	-	3500	116
	Hi-Temp 90°C	200	60	1.15	DOL (3)	2766520003	-	4500	145
		230	60	1.15	DOL (3)	2766020003	-	4500	145
		380	60	1.15	DOL (3)	2766620003	-	4500	145
		460/380	60/50	1.15/1.0	DOL (3)	2766120003	Yes	4500	145
		460/380	60/50	1.15/1.0	Y-Δ (6)	2767120003	-	4500	150
		575	60	1.15	DOL (3)	2766220003	-	4500	145
	Hi-Temp 90°C - 316 SS	200	60	1.15	DOL (3)	2766523003	-	4500	145
		230	60	1.15	DOL (3)	2766023003	-	4500	145
		380	60	1.15	DOL (3)	2766623003	-	4500	145
		460/380	60/50	1.15/1.0	DOL (3)	2766123003	-	4500	145
		575	60	1.15	DOL (3)	2766223003	-	4500	145

6" SUBMERSIBLE MOTORS - DIMENSIONS AND WEIGHTS

STANDARD

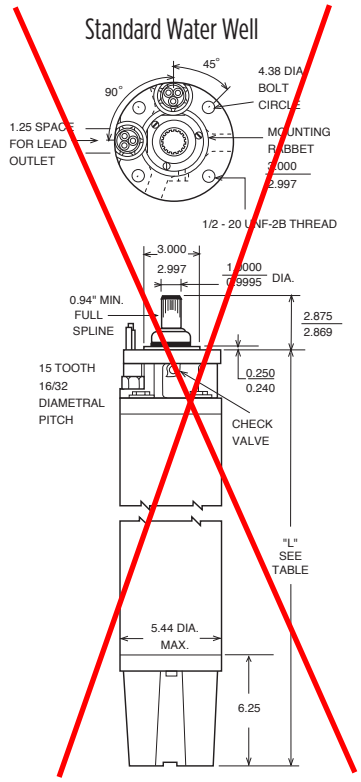
HP / kW	Construction	"L" (in)	Motor Carton Size (in)			Shipping Wt.	
			W	H	L	lbs	kg
5 / 3.7	304 SS 3-Lead	22.9	7.50	10.75	34.50	101	46
	316 SS 3-Lead	22.5	7.50	10.75	34.50	101	46
7.5 / 5.5	304 SS 3-Lead	24.2	7.50	10.75	34.50	108	49
	316 SS 3-Lead	23.8	7.50	10.75	34.50	108	49
10 / 7.5	304 SS 3-Lead	25.4	7.50	10.75	34.50	116	53
	316 SS 3-Lead	25.0	7.50	10.75	34.50	116	53
15 / 11	304 SS 3-Lead	28.0	7.50	10.75	34.50	129	59
	316 SS 3-Lead	27.6	7.50	10.75	34.50	129	59
20 / 15	304 SS 3-Lead	30.6	7.50	10.75	37.00	145	66
	316 SS 3-Lead	30.2	7.50	10.75	37.00	145	66
25 / 18.5	304 SS 3-Lead	33.1	7.50	10.75	42.25	156	71
	316 SS 3-Lead	32.7	7.50	10.75	42.25	156	71
30 / 22	304 SS 3-Lead	35.7	7.50	10.75	42.25	174	79
	316 SS 3-Lead	35.3	7.50	10.75	42.25	174	79
40 / 30	304 SS 3-Lead	40.8	7.50	10.75	47.25	202	92
	316 SS 3-Lead	40.4	7.50	10.75	47.25	202	92
50 / 37	304 SS 3-Lead	55.3	8.75	10.50	71.75	300	136
	316 SS 3-Lead	59.2	8.75	10.50	71.75	300	136
60 - 45	304 SS 3-Lead	61.3	8.75	10.50	71.75	330	150
	316 SS 3-Lead	65.2	8.75	10.50	71.75	330	150

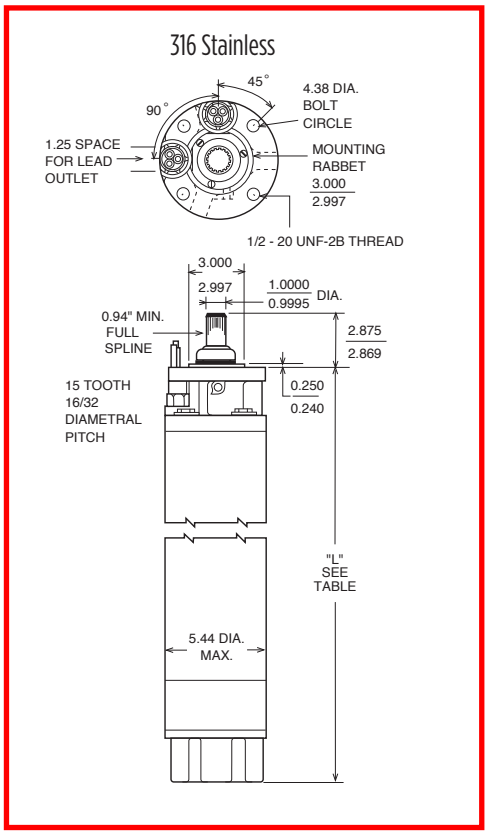
NOTE: 6-Lead Y-Δ models available (add 5 lbs to shipping weight)

HIGH TEMP 90

HP / kW	Construction	L (in)	Motor Carton Size (in)			Shipping Wt.	
			W	H	L	lbs	kg
5 / 3.7	304 SS 3-Lead	26.4	9	11	35	116	53
	316 SS 3-Lead	26.4	9	11	35	116	53
7.5 / 5.5	304 SS 3-Lead	28.96	9	11	37	129	59
	316 SS 3-Lead	28.96	9	11	37	129	59
10 / 7.5	304 SS 3-Lead	31.52	9	11	42	145	66
	316 SS 3-Lead	31.52	9	11	42	145	66
15 / 11	304 SS 3-Lead	34.09	9	11	42	156	71
	316 SS 3-Lead	34.09	9	11	42	156	71
20 / 15	304 SS 3-Lead	36.65	9	11	51	174	79
	316 SS 3-Lead	36.65	9	11	51	174	79
25 / 18.5	304 SS 3-Lead	41.77	9	11	51	202	92
	316 SS 3-Lead	41.77	9	11	51	202	92
30 / 22	304 SS 3-Lead	58.14	9	11	72	300	136
	316 SS 3-Lead	58.14	9	11	72	300	136
40 / 30	304 SS 3-Lead	64.14	9	11	72	330	150
	316 SS 3-Lead	64.14	9	11	72	330	150

NOTE: 6-Lead Y-Δ models available (add 5 lbs to shipping weight)





Three-Phase Motors

APPLICATION

Table 30 – 60 Hz 6" Standard & Hi-Temp Motors

HP	KW	VOLTS	NEMA STARTER SIZE	HEATERS FOR OVERLOAD RELAYS		ADJUSTABLE RELAYS (NOTE 3)	
				FURNAS (NOTE 1)	G.E. (NOTE 2)	SET	MAX.
5	3.7	200	1	K61	L220B	17.6	19.1
		230	1	K61	L199B	15.4	16.6
		380	0	K52	L122B	9.4	10.1
		460	0	K49	L100B	7.7	8.3
		575	0	K42	L825A	6.1	6.6
7.5	5.5	200	1	K67	L322B	26.3	28.3
		230	1	K64	L293B	22.9	24.6
		380	1	K57	L165B	13.9	14.9
		460	1	K54	L147B	11.4	12.3
		575	1	K52	L111B	9.1	9.8
10	7.5	200	2(1)	K72	L426B	34.4	37.0
		230	2(1)	K70	L390B	29.9	32.2
		380	1	K61	L220B	18.1	19.5
		460	1	K58	L181B	15.0	16.1
		575	1	K55	L147B	12.0	12.9
15	11	200	3(1)	K76	L650B	50.7	54.5
		230	2	K75	L520B	44.1	47.4
		380	2(1)	K68	L322B	26.7	28.7
		460	2(1)	K64	L265B	22.0	23.7
		575	2(1)	K61	L220B	17.7	19.0
20	15	200	3	K78	L787B	64.8	69.7
		230	3(1)	K77	L710B	56.4	60.6
		380	2	K72	L426B	34.1	36.7
		460	2	K69	L352B	28.2	30.3
		575	2	K64	L393B	22.7	24.4
25	18.5	200	3	K86	L107C	80.3	86.3
		230	3	K83	L866B	69.8	75.0
		380	2	K74	L520B	42.2	45.4
		460	2	K72	L426B	34.9	37.5
		575	2	K69	L352B	27.9	30.0
30	22	200	4(1)	K88	L126C	96.7	104.0
		230	3	K87	L107C	84.1	90.4
		380	3(1)	K76	L650B	50.9	54.7
		460	3(1)	K74	L520B	42.0	45.2
		575	3(1)	K72	L390B	33.7	36.2
40	30	380	3	K83	L866B	69.8	75.0
		460	3	K77	L710B	57.7	62.0
		575	3	K74	L593B	46.1	49.6
50	37	380	3	K87	L107C	86.7	93.2
		460	3	K83	L950B	71.6	77.0
		575	3	K77	L710B	57.3	61.6
60	45	380	4(1)	K89	L126C	102.5	110.2
		460	4(1)	K87	L107C	84.6	91.0
		575	4(1)	K78	L866B	67.7	72.8

Footnotes for Tables 29, 30, 31, and 31A

NOTE 1: Furnas intermediate sizes between NEMA starter sizes apply where (1) is shown in tables, size 1.75 replacing 2, 2.5 replacing 3, 3.5 replacing 4, and 4.5 replacing 5. Heaters were selected from Catalog 294, table 332 and table 632 (starter size 00, size B). Size 4 starters are heater type 4 (JG). Starters using these heater tables include classes 14, 17, and 18 (inNOVA), classes 36 and 37 (reduced voltage), and classes 87, 88, and 89 (pump and motor control centers). Overload relay adjustments should be set no higher than 100% unless necessary to stop nuisance tripping with measured amps in all lines below nameplate maximum. Heater selections for class 16 starters (Magnetic Definite Purpose) will be furnished upon request.

NOTE 2: General Electric heaters are type CR123 usable only on type CR124 overload relays and were selected from Catalog GEP-1260J, page 184. Adjustment should be set no higher than 100%, unless necessary to stop nuisance tripping with measured amps in all lines below nameplate maximum.

NOTE 3: Adjustable overload relay amp settings apply to approved types listed. Relay adjustment should be set at the specified SET amps. Only if tripping occurs with amps in all lines measured to be within nameplate maximum amps should the setting be increased, not to exceed the MAX value shown.

NOTE 4: Heaters shown for ratings requiring NEMA size 5 or 6 starters are all used with current transformers per manufacturer standards. Adjustable relays may or may not use current transformers depending on design.

Three-Phase Motors

APPLICATION

SubMonitor Three-Phase Protection

Applications

SubMonitor is designed to protect 3-phase pumps/motors with service factor amp ratings (SFA) from 5 to 350 A (approx. 3 to 200 hp). Current, voltage, and motor temperature are monitored using all three legs and allows the user to set up the SubMonitor quickly and easily.

Protects Against

- Under/Overload
- Under/Overvoltage
- Current Unbalance
- Overheated Motor (if equipped with Subtrol Heat Sensor)
- False Start (Chattering)
- Phase Reversal

This product is lead free.

Power Factor Correction

In some installations, power supply limitations make it necessary or desirable to increase the power factor of a submersible motor. Table 32 lists the capacitive kVAR required to increase the power factor of large Franklin three-phase submersible motors to the approximate values shown at maximum input loading.

Capacitors must be connected on the line side of the overload relay, or overload protection will be lost.

Table 32 kVAR Required 60 Hz

MOTOR		KVAR REQUIRED FOR PF OF:		
HP	KW	0.90	0.95	1.00
5	3.7	1.2	2.1	4.0
7.5	5.5	1.7	3.1	6.0
10	7.5	1.5	3.3	7.0
15	11	2.2	4.7	10.0
20	15	1.7	5.0	12.0
25	18.5	2.1	6.2	15.0
30	22	2.5	7.4	18.0
40	30	4.5	11.0	24.0
50	37	7.1	15.0	32.0
60	45	8.4	18.0	38.0
75	55	6.3	18.0	43.0
100	75	11.0	27.0	60.0
125	93	17.0	36.0	77.0
150	110	20.0	42.0	90.0
175	130	9.6	36.0	93.0
200	150	16.0	46.0	110.0

Values listed are total required (not per phase).

Tightening Motor Lead Connector Jam Nut

4" Motors with Jam Nut:
15 to 20 ft-lb (20 to 27 Nm)

4" Motors with 2 Screw Clamp Plate:
35 to 45 in-lb (40 to 51 Nm)

6" Motors:
40 to 50 ft-lb (54 to 68 Nm)

8" Motors with 1-3/16" to 1-5/8" Jam Nut:
50 to 60 ft-lb (68 to 81 Nm)

8" Motors with 4 Screw Clamp Plate:
Apply increasing torque to the screws equally in a criss-cross pattern until 80 to 90 in-lb (9.0 to 10.2 Nm) is reached.

Jam nut tightening torques recommended for field assembly are shown. Rubber compression set within the first few hours after assembly may reduce the jam nut torque. This is a normal condition which does not indicate reduced seal effectiveness. Retightening is not required, but is permissible and recommended if original torque was questionable.

A motor lead assembly should not be reused. A new lead assembly should be used whenever one is removed from the motor, because rubber set and possible damage from removal may prevent proper resealing of the old lead.

All motors returned for warranty consideration must have the lead returned with the motor.

Pump to Motor Coupling

Assemble coupling with non-toxic FDA approved waterproof grease such as Mobile FM222, Texaco CYGNUS2661, or approved equivalent. This prevents abrasives from entering the spline area and prolongs spline life.

Pump to Motor Assembly

After assembling the motor to the pump, torque mounting fasteners to the following:

4" Pump and Motor: 10 lb-ft (14 Nm)

6" Pump and Motor: 50 lb-ft (68 Nm)

8" Pump and Motor: 120 lb-ft (163 Nm)

Shaft Height and Free End Play

Table 43

MOTOR	NORMAL SHAFT HEIGHT		DIMENSION SHAFT HEIGHT		FREE END PLAY	
					MIN.	MAX.
4"	1 1/2"	38.1 mm	1.508" / 1.498"	38.30 / 38.05 mm	0.010" 0.25 mm	0.045" 1.14 mm
6"	2 7/8"	73.0 mm	2.875" / 2.869"	73.02 / 72.88 mm	0.030" 0.76 mm	0.050" 1.27 mm
8" TYPE 1	4"	101.6 mm	4.000" / 3.990"	101.60 / 101.35 mm	0.008" 0.20 mm	0.032" 0.81 mm
8" TYPE 2.1	4"	101.6 mm	4.000" / 3.990"	101.60 / 101.35 mm	0.030" 0.76 mm	0.080" 2.03 mm

If the height, measured from the pump-mounting surface of the motor, is low and/or end play exceeds the limit, the motor thrust bearing is possibly damaged, and should be replaced.

Submersible Leads and Cables

A common question is why motor leads are smaller than specified in Franklin's cable charts.

The leads are considered a part of the motor and actually are a connection between the large supply wire and the motor winding. The motor leads are short and there is virtually no voltage drop across the lead.

In addition, the lead assemblies **operate under water**, while at least part of the supply cable must **operate in air.** Lead assemblies running under water operate cooler.

CAUTION: Lead assemblies on submersible motors are suitable only for use in water and may overheat and cause failure if operated in air.

System Troubleshooting

Motor Does Not Start

POSSIBLE CAUSE	CHECKING PROCEDURES	CORRECTIVE ACTION
A. No power or incorrect voltage	Check voltage at line terminals. The voltage must be ± 10% of rated voltage.	Contact power company if voltage is incorrect.
B. Fuses blown or circuit breakers tripped	Check fuses for recommended size and check for loose, dirty or corroded connections in fuse receptacle. Check for tripped circuit breakers.	Replace with proper fuse or reset circuit breakers.
C. Defective pressure switch	Check voltage at contact points. Improper contact of switch points can cause voltage less than line voltage.	Replace pressure switch or clean points.
D. Control box malfunction	For detailed procedure, see pages 48-57.	Repair or replace.
E. Defective wiring	Check for loose or corroded connections or defective wiring.	Correct faulty wiring or connections.
F. Bound pump	Check for misalignment between pump and motor or a sand bound pump. Amp readings will be 3 to 6 times higher than normal until the overload trips.	Pull pump and correct problem. Run new installation until the water clears.
G. Defective cable or motor	For detailed procedure, see pages 46 & 47.	Repair or replace.

Motor Starts Too Often

A. Pressure switch	Check setting on pressure switch and examine for defects.	Reset limit or replace switch.
B. Check valve - stuck open	Damaged or defective check valve will not hold pressure.	Replace if defective.
C. Waterlogged tank	Check air charge.	Clean or replace.
D. Leak in system	Check system for leaks.	Replace damaged pipes or repair leaks.

System Troubleshooting

Motor Runs Continuously

POSSIBLE CAUSE	CHECKING PROCEDURES	CORRECTIVE ACTION
A. Pressure switch	Check switch for welded contacts. Check switch adjustments.	Clean contacts, replace switch, or adjust setting.
B. Low water level in well	Pump may exceed well capacity. Shut off pump, wait for well to recover. Check static and drawdown level from well head.	Throttle pump output or reset pump to lower level. Do not lower if sand may clog pump.
C. Leak in system	Check system for leaks.	Replace damaged pipes or repair leaks.
D. Worn pump	Symptoms of worn pump are similar to those of drop pipe leak or low water level in well. Reduce pressure switch setting, if pump shuts off worn parts may be the fault.	Pull pump and replace worn parts.
E. Loose coupling or broken motor shaft	Check for loose coupling or damaged shaft.	Replace worn or damaged parts.
F. Pump screen blocked	Check for clogged intake screen.	Clean screen and reset pump depth.
G. Check valve stuck closed	Check operation of check valve.	Replace if defective.
H. Control box malfunction	See pages 48-57 for single-phase.	Repair or replace.

Motor Runs But Overload Protector Trips

A. Incorrect voltage	Using voltmeter, check the line terminals. Voltage must be within ± 10% of rated voltage.	Contact power company if voltage is incorrect.
B. Overheated protectors	Direct sunlight or other heat source can raise control box temperature causing protectors to trip. The box must not be hot to touch.	Shade box, provide ventilation or move box away from source.
C. Defective control box	For detailed procedures, see pages 48-57.	Repair or replace.
D. Defective motor or cable	For detailed procedures, see pages 45 & 46.	Repair or replace.
E. Worn pump or motor	Check running current, see tables 13, 22, 24, 25, & 27.	Replace pump and/or motor.

Table 46 Preliminary Tests - All Sizes Single- and Three-Phase

TEST	PROCEDURE	WHAT IT MEANS
Insulation Resistance (Fig. 10)	1. Open master breaker and disconnect all leads from control box or pressure switch (QD type control, remove lid) to avoid electric shock hazard and damage to the meter. 2. Use a megohmmeter set to 1000-volt (500-volt minimum). If using an ohmmeter, set to R X 100k. Zero the meter. 3. Connect one meter lead to any one of the motor leads and the other lead to the metal drop pipe. If the drop pipe is plastic, connect the meter lead to ground.	1. If the ohms value is normal (Table 47), the motor is not grounded and the cable insulation is not damaged. 2. If the ohms value is below normal, either the windings are grounded or the cable insulation is damaged. Check the cable at the well seal as the insulation is sometimes damaged by being pinched.
Winding Resistance (Fig 11.)	1. Open master breaker and disconnect all leads from control box or pressure switch (QD type control, remove lid) to avoid electric shock hazard and damage to the meter. 2. Use a multi-meter set to 20 ohms or an ohmmeter set to R X 1 for values under 10 ohms. Use next scale up for values over 10 ohms. Zero the meter. 3. On 3-wire motors measure the resistance of yellow to black (main winding) and yellow to red (start winding). On 2-wire motors: measure the resistance from line-to-line. Three-phase motors: measure the resistance line-to-line for all three combinations.	1. If all ohms values are normal (Tables 13, 22, 24, 25, & 27), the motor windings are neither shorted nor open, and the cable colors are correct 2. If any one value is less than normal, the motor is shorted. 3. If any one ohm value is greater than normal, the winding or the cable is open, or there is a poor cable joint or connection. 4. If some ohms values are greater than normal and some less on single-phase motors, the leads are mixed. See page 48 to verify cable colors.

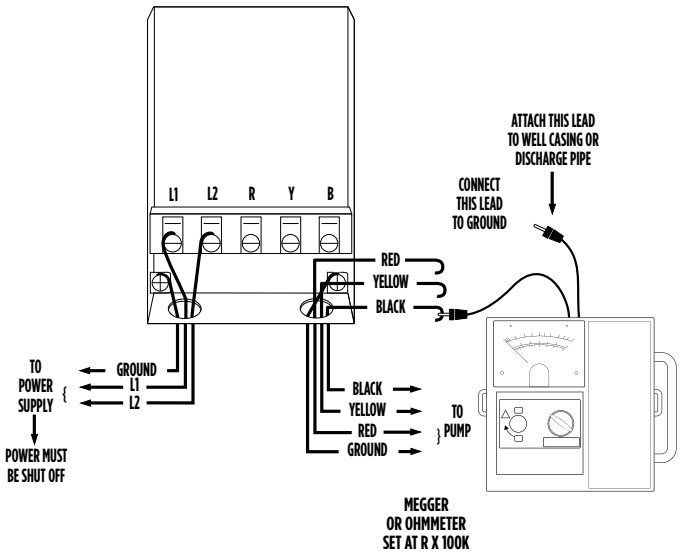


FIG. 10

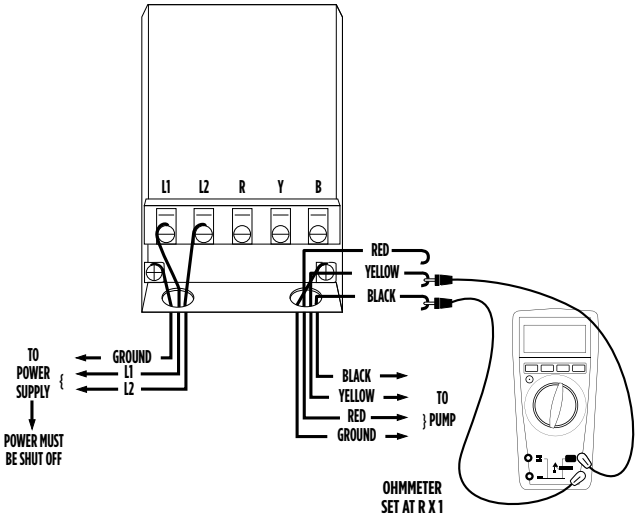


FIG. 11

Insulation Resistance Readings

Table 47 Normal ohm and Megohm Values Between All Leads and Ground

CONDITION OF MOTOR AND LEADS	MEGOHM VALUE	OHMS VALUE
A new motor (without drop cable)	200.0 (or more)	200,000,000 (or more)
A used motor which can be reinstalled in well	10.0 (or more)	10,000,000 (or more)
MOTOR IN WELL. READINGS ARE FOR DROP CABLE PLUS MOTOR.		
New motor	2.0 (or more)	2,000,000 (or more)
Motor in good condition	0.50 - 2.0	500,000 - 2,000,000
Insulation damage, locate and repair	Less than .50	Less than 500,000

Insulation resistance varies very little with rating. Motors of all hp, voltage, and phase rating have similar values of insulation resistance. The table above is based on readings taken with a megohm meter with a 500 VDC output. Readings may vary using a lower voltage ohmmeter; consult Franklin Electric if readings are in question.

Resistance of Drop Cable (ohms)

The values below are for copper conductors. If aluminum conductor drop cable is used, the resistance will be higher. To determine the actual resistance of the aluminum drop cable, divide the ohm readings from this chart by 0.61. This chart shows total resistance of cable from control to motor and back.

Winding Resistance Measuring

The winding resistance measured at the motor should fall within the values in Tables 13, 22, 24, 25, & 27. When measured through the drop cable, the resistance of the drop cable must be subtracted from the ohmmeter readings to get the winding resistance of the motor. See table below.

Table 47A DC Resistance in ohms per 100 ft of Wire (Two conductors) @ 50 °F

AWG OR MCM WIRE SIZE (COPPER)	14	12	10	8	6	4	3	2
OHMS	0.544	0.338	0.214	0.135	0.082	0.052	0.041	0.032

1	1/0	2/0	3/0	4/0	250	300	350	400	500	600	700
0.026	0.021	0.017	0.013	0.010	0.0088	0.0073	0.0063	0.0056	0.0044	0.0037	0.0032

SubMonitor

SubMonitor Troubleshooting

FAULT MESSAGE	PROBLEM/CONDITION	POSSIBLE CAUSE
SF Amps Set Too High	SF Amps setting above 359 Amps.	Motor SF Amps not entered.
Phase Reversal	Reversed incoming voltage phase sequence.	Incoming power problem.
Underload	Normal line current.	Wrong SF Max Amps setting.
	Low line current.	Over pumping well. Clogged pump intake. Closed valve. Loose pump impeller. Broken shaft or coupling. Phase loss.
Overload	Normal line current.	Wrong SF Max Amps setting.
	High line current.	High or low line voltage. Ground fault. Pump or motor dragging. Motor stalled or bound pump.
Overheat	Motor temperature sensor has detected excess motor temperature.	High or low line voltage. Motor is overloaded. Excessive current unbalance. Poor motor cooling. High water temperature. Excessive electrical noise (VFD in close proximity).
Unbalance	Current difference between any two legs exceeds programmed setting.	Phase loss. Unbalanced power supply. Open Delta transformer.
Overvoltage	Line voltage exceeds programmed setting.	Unstable power supply.
Undervoltage	Line voltage below programmed setting.	Poor connection in motor power circuit. Unstable or weak power supply.
False Starts	Power has been interrupted too many times in a 10 second period.	Chattering contacts. Loose connections in motor power circuit. Arcing contacts.

Electronic Products

APPLICATION

A	Amp or amperage
AWG	American Wire Gauge
BJT	Bipolar Junction Transistor
°C	Degree Celsius
CB	Control Box
CRC	Capacitor Run Control
DI	Deionized
DOL	Direct on Line
Dv/dt	Rise Time of the Voltage
EFF	Efficiency
°F	Degree Fahrenheit
FDA	Food & Drug Administration
FL	Full Load
ft	Foot
ft-lb	Foot Pound
ft/s	Feet per Second
GFCI	Ground Fault Circuit Interrupter
gpm	Gallon per Minute
HERO	High Efficiency Reverse Osmosis
hp	Horsepower
Hz	Hertz
ID	Inside Diameter
IGBT	Insulated Gate Bipolar Transistor
in	Inch
kVA	Kilovolt Amp
kVAR	Kilovolt Amp Rating
kW	Kilowatt (1000 watts)
L1, L2, L3	Line One, Line Two, Line Three
lb-ft	Pound Feet
L/min	Liter per Minute
mA	Milliamp
max	Maximum
MCM	Thousand Circular Mils
mm	Millimeter
MOV	Metal Oxide Varister
NEC	National Electrical Code
NEMA	National Electrical Manufacturer Association
Nm	Newton Meter
NPSH	Net Positive Suction Head
OD	Outside Diameter
OL	Overload
PF	Power Factor
psi	Pounds per Square Inch
PWM	Pulse Width Modulation
QD	Quick Disconnect
R	Resistance
RMA	Return Material Authorization
RMS	Root Mean Squared
rpm	Revolutions per Minute
SF	Service Factor
SFhp	Service Factor Horsepower
S/N	Serial Number
TDH	Total Dynamic Head
UNF	Fine Thread
V	Voltage
VAC	Voltage Alternating Current
VDC	Voltage Direct Current
VFD	Variable Frequency Drive
W	Watts
XFMR	Transformer
Y-D	Wye-Delta
Ω	ohms

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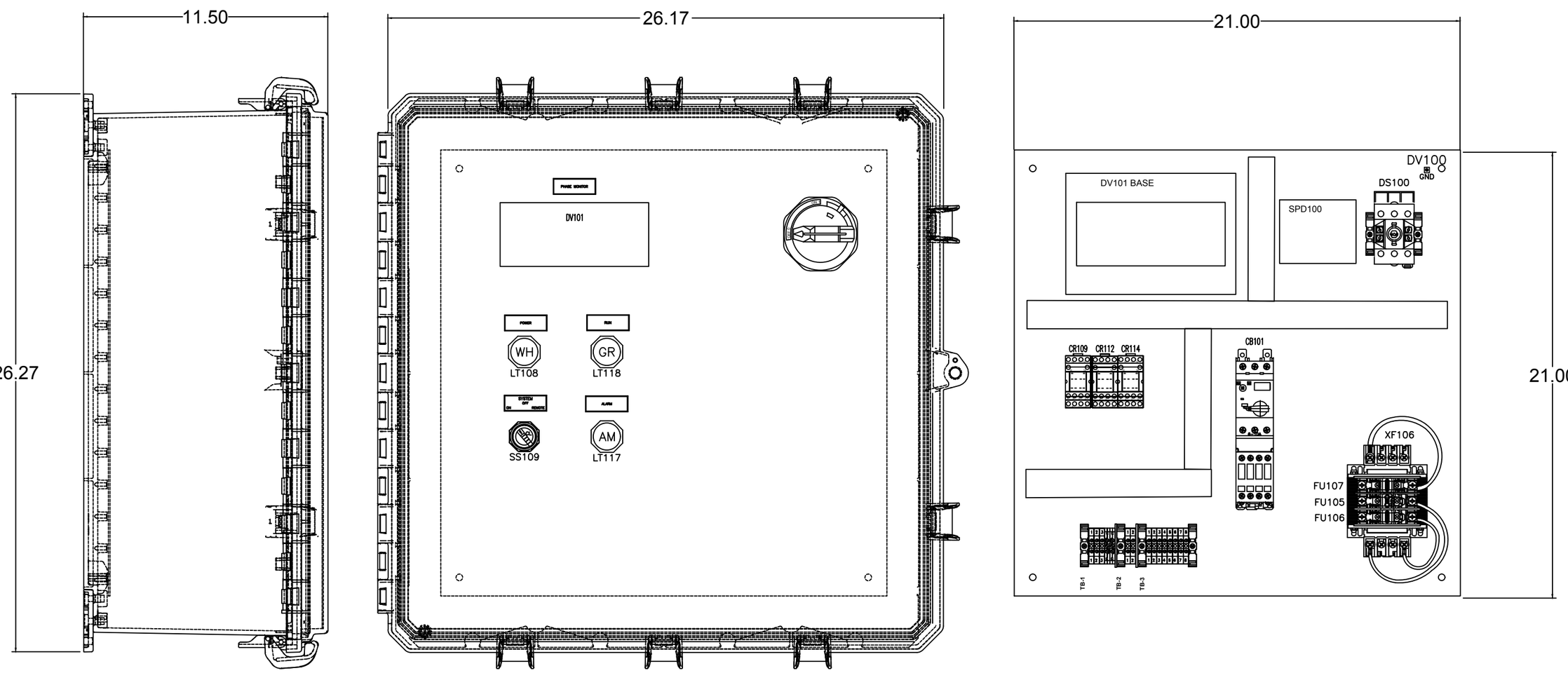
Franklin Electric

SECTION 3

ELECTRICAL DRAWINGS & COMPONENTS

3.1

DWG No	REV
1081083-300	B



PHASE MONITOR

POWER

RUN

SYSTEM
OFF
ON REMOTE

ALARM

REV	DATE	DESCRIPTION	BY
B	08-22-18	ENGINEERING REVIEW	KSP

REVISIONS

CUSTOMER

PROMINENT FLUID CONTROLS

JOB No	1081083	PURCHASE ORDER No	XX

TITLE: SUBMERSIBLE MIXER 5HP
ENCLOSURE AND SUB PANEL LAYOUT

ENGINEERS SEAL

ProMinent®
THE PROMINENT GROUP OF COMPANIES

PITTSBURGH, PA USA WWW.PROMINENT.US

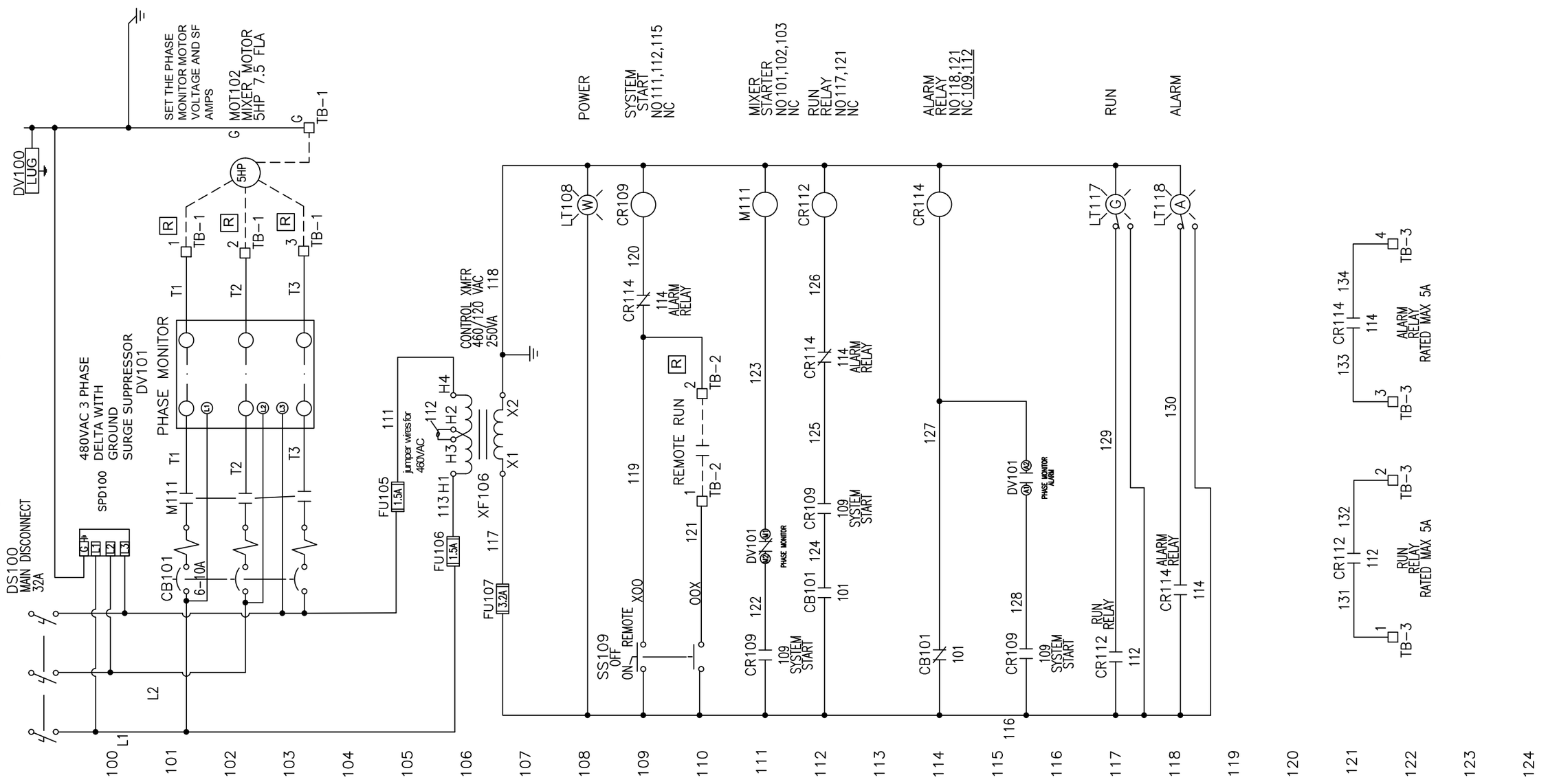
PROMINENT FLUID CONTROLS, INC.
RIDC PARK WEST
136 INDUSTRY DRIVE
PITTSBURGH, PA 15275 USA
TEL. 412 787 2484 FAX. 412 787 0704

DESIGNED	VI	APPROVED	RM
DRAWN	VI	SCALE	NTS
CHECKED	RM	DATE	08-22-18

DWG No 1081083-300 | REV B | PAGE 1/1

DWG No 1081083-301 | REV B

CUSTOMER POWER SUPPLY
460VAC,3PH,60HZ, 15 AMP, BRANCH CIRCUIT
PROTECTION AND/OR OVERLOAD RELAY TO
BE PROVIDED BY INSTALLER



LEGEND

— · — · —	PHASE MONITOR WIRES
———	CP WIRE
- - - - -	SKID OR FIELD WIRE
□	CP TERMINAL
R	REMOTELY LOCATED DEVICE

UL LABEL INFO
SOURCE 460VAC 3PH 60HZ
PANEL FLA 11 AMPS
LARGEST MOTOR 7.5 FLA
DWG SERIES 1081083-30X
TYPE 4X SCCR 10K RMS SYM 460V MAX
FIELD TERMINATIONS COPPER CONDUCTOR ONLY

REV	DATE	DESCRIPTION	BY
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CUSTOMER **PROMINENT FLUID CONTROLS**

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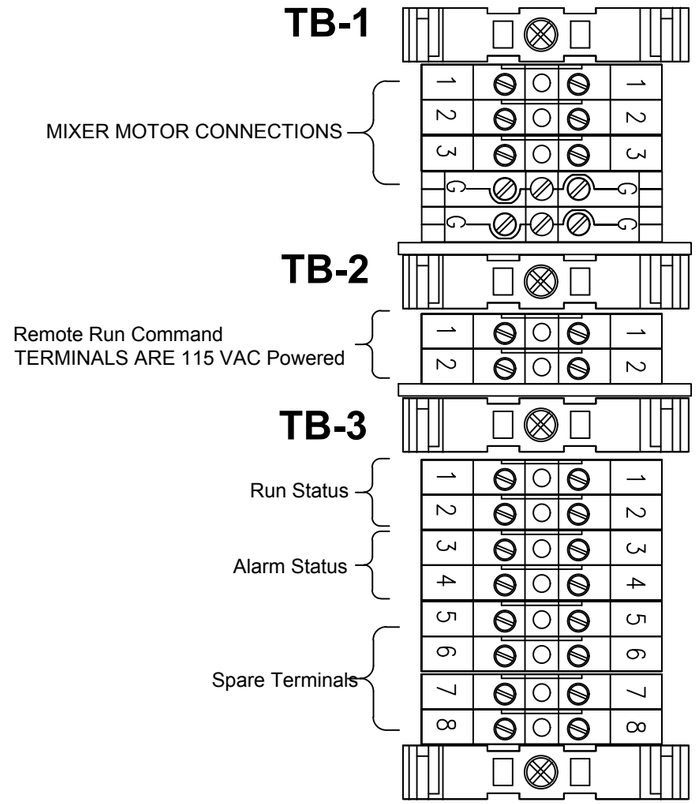
JOB No	1081083	PURCHASE ORDER No	XX

TITLE SUBMERSIBLE MIXER 5HP ELECTRICAL SCHEMATIC

DWG No 1081083-301 | REV B | PAGE 1/1

DWG No	REV
1081083–302	B



REV	DATE	DESCRIPTION	BY
B	08–22–18	ENGINEERING REVIEW	KSP

REVISIONS

CUSTOMER

PROMINENT FLUID CONTROLS

JOB No 1081083 | PURCHASE ORDER No XX

TITLE: SUBMERSIBLE MIXER 5 HP TERMINAL STRIP DETAILS

DWG No: 1081083–302 | REV: B | PAGE: 1/1

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DESIGNED	VI	APPROVED	RM
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CHECKED	RM	DATE	08–22–18

TAGS	QTY	SUB	CATALOG	MFG	DESCRIPTION
	1		7747188	INTEGRA	TYPE 4X ENCLOSURE POLYCARBONATE ENCLOSURE NEMA 3, 3R, 4, 4X, 12, 13 24 X 24 X 10 PREMIUM LINE
	1	*1	7747194	INTEGRA	INTEGRA SUB PANEL
CR109 CR112 CR114	3	*1	7746413	SQD	ZELIO PLUG-IN RELAY WITH MAN TEST & PILOT LIGHT 8501RXM4AB2F7 ZELIO 4PDT 120VAC COIL 4 FORM C, 6A
	3	*1	7746415	SQD	TYPE RXM SOCKET RXZE2S114M 14-PIN SOCKET USED W/ TYPE 8501-RXM RELAYS
DS100	1		7745933	C3 CONTROLS	NON FUSED DISCONNECT32 AMP TYPE 4X HANDLE, PANEL MOUNT DISCONNECT 32AMP 3 PHASE PFC #: 7745933
DV100	1		7746127	MARATHON	GROUNDING LUG GL02 #2-#14AWG
FU104 FU106	2		1081480	FERRAZ/SHAWMUTT	TIME DELAY CLASS CC FUSE FOR XFMR PRIMARY CIRCUITS 600VAC, 200KA I.R. 1.5A, ATQR1.5
FU107	1		1050239	FERRAZ/SHAWMUTT	TIME DELAY CLASS CC FUSE FOR XFMR PRIMARY CIRCUITS 600VAC, 200KA I.R. 3.2A, ATQR3.2
LT116	1		7745909	SQD	SQ D 30MM GREEN PTT PILOT LIGHT 120VAC 9001-SKT38LGG31
LT117	1		7745910	SQD	SQ D 30MM AMBER PTT LED LIGHT 120VAC 9001-SKT38LYA31
LT108	1		7747135	SQD	SQ D 30MM PILOT LIGHT WHITE LED 120VAC 9001SKT38LWW31
CB101	1		1078793	SQD	STARTER KIT 6.0 - 10 AMP
	1	*1	1078795	SQD	LC1D12G7 CONTACTOR KIT
SS109	1		7745916	SQD	SELECTOR SW - 3 POS MAINT, NEMA 4/4X 30.5mm BLACK GLOVED KNOB 2 NO 2 NC CAM TYPE C, CONTACT POSITION: 1-KA1, 2-KA1 PFC #: 7745916
XF106	1		1050238	SQD	INDUSTRIAL CONTROL TRANSFORMER, CLASS 9070 0.25KVA 240X480V-120V, 230X460V-115V, 220X440V-110V, 50/60HZ INDUSTRIAL TRANSFORMER TYPE TF, TRIPLE RATED VOLTAGE PFC #: 1050238
			77455053	PFC	DIN RAIL AS REQUIRED
TB-1	2		7746750	PHOENIX CONTACT	UNIVERSAL GROUND TERMINAL BLOCK - USLKG 5 FEED-THROUGH GROUND GREEN-YELLOW, 0.2-4MM^2, 26-10 AWG CLIPLINE - MODULAR SCREW TERMINAL BLOCK
TB-1 TB-2 TB-3	13		7746748	PHOENIX CONTACT	UNIVERSAL TERMINAL BLOCK - UK 5 N FEED-THROUGH 41AMPS GRAY, 0.2-4MM^2, 30-10 AWG CLIPLINE - MODULAR SCREW TERMINAL BLOCK 3004362
	2		7746749	PHOENIX CONTACT	ATP-UK 3/5 - UK5N END PLATE/DIVIDER SINGLE-LEVEL CLIPLINE- TERMINAL BLOCK WITH HYBRID SOLDER CONNECTION
	6		7746751	PHOENIX CONTACT	END BRACKET - E/NS 35 N ACCESSORY END BRACKET GRAY, FOR THE NS 35 DIN RAIL 9.5MM WIDTH
	4		7500386		LABEL AS REQUIRED
DV101	1		1081038	FRANKLIN ELECTRIC	SUBMONITOR PHASE MONITOR BASE AND DISPLAY 0-600VAC INPUT
SPD100	1	*1	1081039	SQD	SURGE SUPPRESSOR 3PH DELTA

DWG No 1081083–303 REV B

REV B 08–22–18 ENGINEERING REVIEW
DESCRIPTION
REVISIONS
BY KSP

CUSTOMER
PROMINENT FLUID CONTROLS
JOB No 1081083 PURCHASE ORDER No XX
TITLE SUBMERSIBLE MIXER 5HP
BILL OF MATERIAL

ENGINEERS SEAL

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CHECKED RM DATE 08–22–18

DWG No 1081083–303 REV B
PAGE 1/1

3.2

INTEGRA ENCLOSURES

GENESIS LINE 24X24X10 (G242410)

WITH MULTI-MAX RAIL SYSTEM™

UL NEMA 4X RATED (IP66)

Integra's exclusive **Multi-Max Rail System™**
See page 2, bullet 6

ECO FRIENDLY

MADE IN THE USA

GENESIS LINE 24X24X10 (G242410)

WITH MULTI-MAX RAIL SYSTEM™

UL NEMA 4X RATED (IP 66)

Common Accessories

* Pending Patents for Multi-Max Rail System and Panel Pads

1 FRAME STIFFENER

This piece secures just inside the lip of the base with four Multi-Max rails and provide revolutionary rigidity to the enclosure and endless options for mounting. This piece comes pre-installed and is a standard part with every enclosure.

2 POLYCARBONATE LATCH

Strong, durable, UV resistant, polycarbonate latches that match the standard color of the enclosure, provide a secure seal with a clean look. There are four latches that come standard with the enclosure, with the option of adding four more latches for the most challenging applications.

3 FLUSH FLANGE MOUNTING SYSTEM

The recessed area on the top and bottom of the enclosure provide a smooth and integrated look to the mounting flanges. These flanges are screwed on to the back side of the enclosure and are strong and durable for secure mounting of the enclosure. Screws for attaching flanges to the enclosure are included.

4 PAD LOCKABLE

Choose your level of security when you select our Genesis series enclosures. Latches only, self tapping screw, pad lock or tag-out are all standard capabilities for this enclosure

5 REAR WALL MOUNTING PANEL BOSSES

The mounting panel bosses in the Genesis series have brass inserts that improve the holding strength of the mounting panel. Also, these bosses are reinforced with supporting material to provide extra holding force to the finished system.

6 MULTI-MAX RAIL SYSTEM*

The MULTIple configurations for MAXimum options rail system provide unlimited mounting potential for your application. These rails mount vertically by attaching to the rear wall of the enclosure and to the frame stiffener. They can be used all around the interior of the enclosure to create three dimensional use of all of the space inside the enclosure. Uses for these rails include attaching side wall mounting panels, din rail, electrical components, shelves, panel pads, etc. Extra rails may be purchased as an accessory to help support heavier loads or further tailor the interior of the enclosure to your application. Four of these rails come standard with every enclosure.

7 LOW PROFILE STAINLESS STEEL HINGE PIN

Strong, piano hinge style hinge pin provides rigid and repeatable door operation even with components mounted in the door.

8 LID BOSSES

The Genesis enclosure comes standard with four bosses inside the lid for affixing a standard 24x24 mounting panel. They are brass inserted for long time, durable performance.

9 SWING PANEL

The Genesis swing panel has an aluminum piano style hinge to support the weight of typical 24x24 enclosure applications. The swing panel attaches to the Multi-Max Rails and provides rigid, smooth operation.

10 PANEL PADS*

Panel pads affix to the vertical Multi-Max rails and provide the ability for an aluminum, steel or PVC mounting panel to be set at varying heights inside the enclosure. These pads provide the ability to have multiple mounting panels at different heights. Whether it's a competitive situation or a space restriction more mounting surfaces can save space and money.

11 BACK PANELS

Back panels for the Genesis enclosures are sold separately and are available in Aluminum, White powder coated steel or PVC materials. Hardware for mounting is also included with the back panel.

12 FAN SHROUD KIT

To provide an option for cooling the interior of the enclosure, we created a shroud kit for the Genesis Series enclosures. These polycarbonate shrouds are Nema 3R rated and are often used in pairs with one being the inlet and the other being the exhaust. All hardware for mounting are included in the kit.

* Pending Patents for Multi-Max Rail System and Panel Pads

24X24X10 GENESIS LINE

ECO FRIENDLY

MADE IN THE USA

Atex pending, contact factory for details

GENESIS POLYCARBONATE ENCLOSURE

Features and Benefits

- Integra's largest polycarbonate enclosure to date
- Best in class hinge - Strong standard stainless steel pin, piano style hinge
- Standard Color – light gray with a gloss finish
- Best material – Base, lid, latches, frame, and interior pieces all made of high-impact, UL 94 5VA rated, UV resistant polycarbonate
- Easy ordering – One part number includes mounting flanges, internal stiffener frame, polycarbonate latches and four Multi-Max Rails (Mounting panel sold separately)
- Flexible Interior Mounting – Features Integra's unique and patented Multi-Max Rail System
- Interior Rear wall mounting – multiple bosses for direct mounting of devices and / or din rail
- UL-50 / C-UL Listed (File 207562)

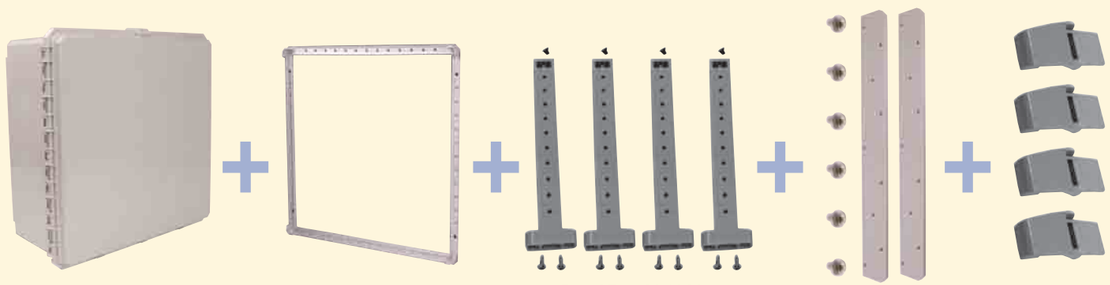
The Integra Genesis series represents the beginning of best medium sized non metallic enclosures available. The unmatched flexibility of the interior of this enclosure combined with off the shelf accessories make the first of the Genesis series enclosures ideal for almost any application.

Mechanical and Thermal	Test Spec.	Unit	Premium Line
Instrumented Dart Impact @ 73° F		in/lb.	565
Falling Ball Impact @ 73° F	UL-746	in/lb.	900
Deflection Temperature @ 264 psi	ASTM D648	Deg. F	270
Modulus of Elasticity	ASTM D790	ksi	340
Temperature Range		Deg. F	-40 to 265
Flammable / UV Ratings	**Test Spec.**	**Unit**	**Premium Line**
Flame Rating - UL	UL 94	-	5VA
Outdoor UV Exposure	UL	-	F1

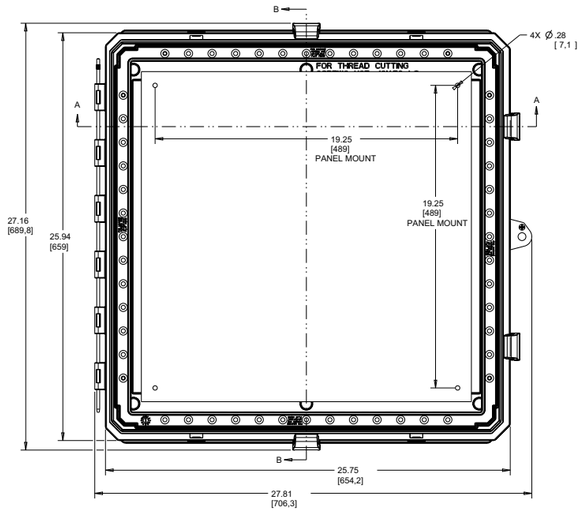
24x24 P/N	Nema 4X (IP66)	Hinged Cover	Opaque Cover	Mounting Flange	Polycarbonate Locking Latch	Multi-Max Rail System
G242410	✓	✓	✓	✓	✓	✓

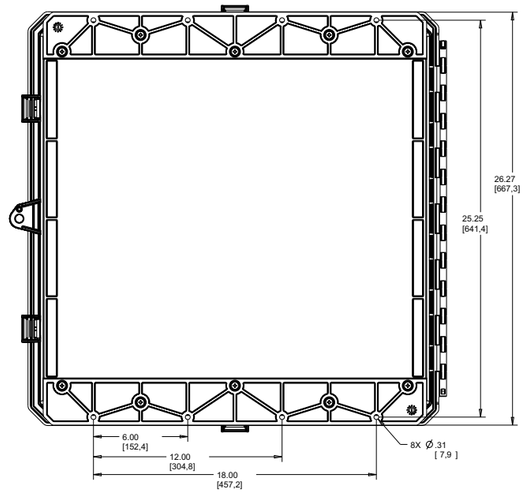
G242410 includes the following

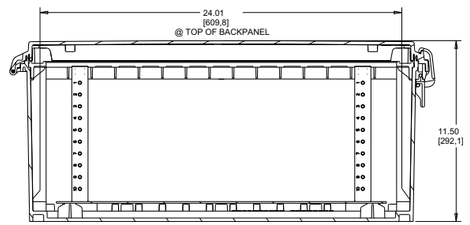
Enclosure, Frame Stiffner, Set of Four Multi-Max Rails (with Screws), Two Mounting Flanges (with Screws), and Four Latches



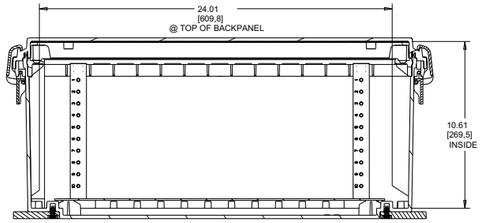
Enclosure | Frame Stiffner (pre-installed) | Set of Four Multi-Max Rail Stiffners | Two Mounting Flanges | Four Latches







SECTION A-A



SECTION B-B

Register online to download this drawing off the Integra website at www.integraenclosures.com | Your company's logo or other information on the lid. Consult factory for details.

Accessories for 24x24x10 Genesis

Multi-Max Rails
GMMR10 KIT - Four multi-max rails with screws included

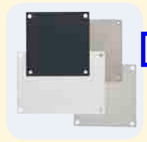
Panel Pads
GPP KIT - Includes four panel pads and screws

Pole Mounting Kits
PMKG-224 - 2" pole
PMKG-324 - 3" pole
PMKG-424 - 4" pole
PMKG-1224 - 12" pole

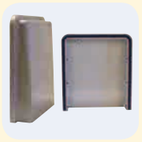
Polycarbonate Latches
GLPC KIT - Polycarbonate latches (4 per pack)

Self-Tapping Screws
SP1/4-20 - Self-tapping screws for bosses (10 per pack)

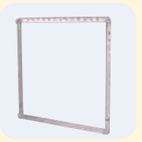
Swing Out Panel System
ABP2424 GSOPK - Aluminum swing panel includes ABP24 and GSOPK24
SBP2424 GSOPK - Steel swing panel includes SBP24 and GSOPK24
GSOPK24 - 24" hinge, panel pads and screws (panel not included)



Back and Swing Panels
ABP2424 - Aluminum panel
SBP2424 - Steel panel
PVCBP2424 - PVC panel



Fan Shroud Kits
FSK-1 - One shroud with gasket and screws
FSK-2 - Two shrouds with gasket and screws



Frame Stiffener Ring
GSR2424 - Frame stiffener ring

INTEGRA INDUSTRIES

INDUSTRIES

Solar Panels

Wind Mills

Water Treatment

Utility & Electrical

Marine & Marina

Remote Monitoring

Electrical Construction

Water Treatment

Car Wash

HVAC

Food

Chemical

Pharmaceutical

Security

Railroad

Toll-Booths

Traffic Lights

Satellite

PRODUCT FAMILY

Integra's enclosures offer superior design, including our use of poly-carbonate material, provides an enclosure that is durable, seals tight, supports easy component installation, and looks great.

Integra maintains an extensive, on hand inventory to support your delivery requirements.

TF: 800.398.3122 ■ T: 440.269.4966 ■ F: 440.269.4977 ■ www.integraenclosures.com

Product data sheet
Characteristics

RXM4AB2F7
Miniature Plug-in relay - Zelio RXM 4 C/O 120 V AC 6 A with LED

Product availability : Stock - Normally stocked in distribution facility

Price* : 6.80 USD

Main

Range of product	Zelio Relay
Series name	Miniature
Product or component type	Plug-in relay
Device short name	RXM
Contacts type and composition	4 C/O
[Uc] control circuit voltage	120 V AC, 50/60 Hz
[Ithe] conventional enclosed thermal current	6 Aat -40...131 °F (-40...55 °C)
Status LED	With
Control type	Lockable test button
Utilisation coefficient	20 %

Complementary

Shape of pin	Flat
[Ui] rated insulation voltage	250 V conforming to IEC 300 V conforming to UL 300 V conforming to CSA
[Uimp] rated impulse withstand voltage	2.5 kV for 1.2/50 µs
Contacts material	AgNi
[Ie] rated operational current	3 A at 28 V DC (NC) conforming to IEC 3 A at 250 V AC (NC) conforming to IEC 6 A at 28 V DC (NO) conforming to IEC 6 A at 250 V AC (NO) conforming to IEC 6 A at 277 V AC conforming to UL 8 A at 30 V DC conforming to UL
Maximum switching voltage	250 V conforming to IEC
Load current	6 A at 250 V AC 6 A at 28 V DC

Maximum switching capacity	1500 VA/168 W
Minimum switching capacity	170 mW at 10 mA, 17 V
Operating rate	<= 18000 cycles/hour no-load <= 1200 cycles/hour under load
Mechanical durability	10000000 cycles
Electrical durability	100000 cycles resistive load
Average coil consumption in VA	1.2 at 60 Hz
Average consumption	1.2 VA 60 Hz
Drop-out voltage threshold	>= 0.15 Uc
Operating time	20 ms
Reset time	20 ms
Average resistance	3630 Ohm at 20 °C +/- 15 %
Rated operational voltage limits	96...132 V AC
Safety reliability data	B10d = 100000
Protection category	RT I
Operating position	Any position
Product weight	0.08 lb(US) (0.037 kg)
Device presentation	Complete product
Compatibility code	RXM

Environment

Dielectric strength	1300 V AC between contacts with micro disconnection insulation 2000 V AC between coil and contact with reinforced insulation 2000 V AC between poles with basic insulation
Product certifications	CE REACH CSA RoHS Lloyd's GOST UL
Standards	UL 508 CSA C22.2 No 14 EN/IEC 61810-1
Ambient air temperature for storage	-40...185 °F (-40...85 °C)
Ambient air temperature for operation	-40...131 °F (-40...55 °C)
Vibration resistance	3 gn (f = 10...150 Hz), amplitude +/- 1 mm (on 5 cycles in operation) 5 gn (f = 10...150 Hz), amplitude +/- 1 mm (on 5 cycles not operating)
IP degree of protection	IP40 conforming to EN/IEC 60529
Shock resistance	10 gn in operation 30 gn not operating
Pollution degree	2

Ordering and shipping details

Category	21127 - ZELIO ICE CUBE RELAYS
Discount Schedule	CP2
GTIN	00785901646464
Nbr. of units in pkg.	10
Package weight(Lbs)	8.0000000000000002E-2
Returnability	Y
Country of origin	CN

Offer Sustainability

Sustainable offer status	Green Premium product
RoHS (date code: YYWW)	Compliant - since 0801 - Schneider Electric declaration of conformity

Schneider Electric declaration of conformity

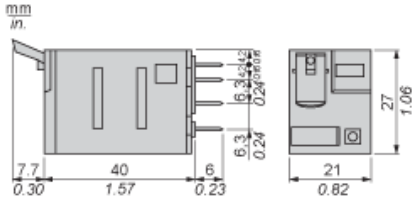
REACh	Reference not containing SVHC above the threshold Reference not containing SVHC above the threshold
Product environmental profile	Available
Product end of life instructions	Need no specific recycling operations

Contractual warranty

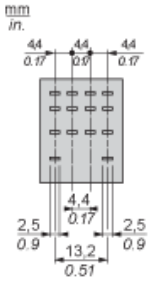
Warranty period	18 months

Dimensions Drawings

Dimensions

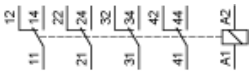


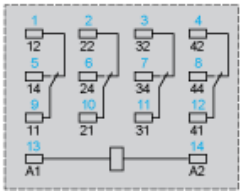
Pin Side View



Connections and Schema

Wiring Diagram



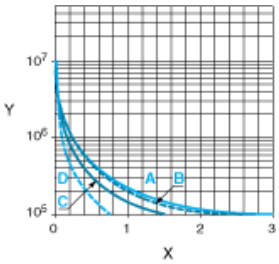


Symbols shown in blue correspond to Nema marking.

Electrical Durability of Contacts

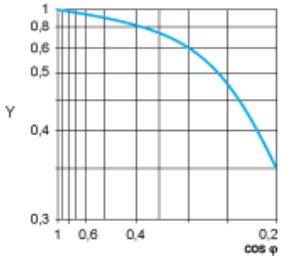
Durability (inductive load) = durability (resistive load) x reduction coefficient.

Resistive AC load



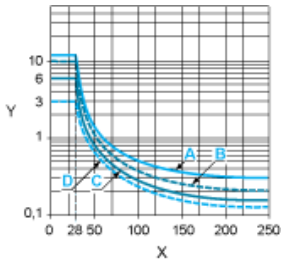
X Switching capacity (kVA)
Y Durability (Number of operating cycles)
A RXM2AB•••
B RXM3AB•••
C RXM4AB•••
D RXM4GB•••

Reduction coefficient for inductive AC load (depending on power factor cos ϕ)



Y Reduction coefficient (A)

Maximum switching capacity on resistive DC load



X Voltage DC
Y Current DC
A RXM2AB•••
B RXM3AB•••
C RXM4AB•••
D RXM4GB•••

Note : These are typical curves, actual durability depends on load, environment, duty cycle, etc.

Product data sheet
Characteristics

RXZE2S114M

socket RXZ - separate contact - 10 A - < 250 V - connector - for relay RXM4..

Product availability : Stock - Normally stocked in distribution facility

Main

Range of product	Zelio Relay
Product or component type	Socket
Contact terminal arrangement	Separate
Product compatibility	Plug-in relay RXM (4 C/O) Plug-in relay REXL (4 C/O)
Shape of pin	Flat
Device short name	RXZ
Sale per indivisible quantity	10

Complementary

[Ith] conventional free air thermal current	5 A , with bus jumper 10 A
System Voltage	< 250 V
Tightening torque	<= 8.85 lbf.in (1 N.m) (M3 screw(s))
Fixing mode	By screw panel Clip-on 35 mm symmetrical DIN rail
Marking	CE
Width	1.06 in (27 mm)
Product weight	0.15 lb(US) (0.07 kg)
Group of product	RXM_4_C/O_CON_SEP_FLAT
Compatibility code	RXZ

Environment

Connections - terminals	Connector, flexible cable with cable end 1 x 0.25...1 x 2.5 mm² / AWG 22...AWG 14 Connector, flexible cable with cable end 2 x 0.25...2 x 1 mm² / AWG 22...AWG 17 Connector, solid cable without cable end 1 x 0.5...1 x 2.5 mm² / AWG 20...AWG 14 Connector, solid cable without cable end 2 x 0.5...2 x 1.5 mm² / AWG 20...AWG 16
Standards	IEC 61984
Product certifications	CSA UL Lloyd's
Ambient air temperature for storage	-40...185 °F (-40...85 °C)

Ambient air temperature for operation	-40...131 °F (-40...55 °C)
IP degree of protection	IP20 conforming to EN/IEC 60529
Dielectric strength	2500 V

Ordering and shipping details

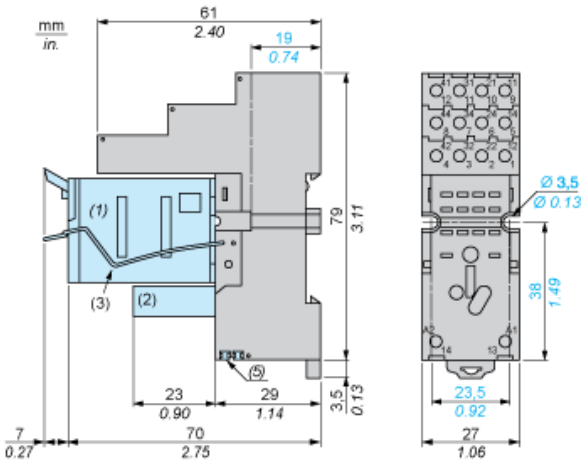
Category	21128 - ZELIO ICE CUBE RELAY ACCESSORIES
Discount Schedule	CP2
GTIN	00785901635758
Nbr. of units in pkg.	10
Package weight(Lbs)	0.14000000000000001
Returnability	Y
Country of origin	CN

Contractual warranty

Warranty period	18 months

Dimensions Drawings

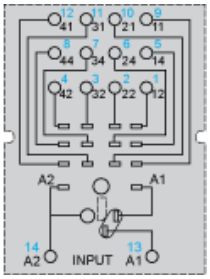
Dimensions



(1) Relays
(2) Protection module
(3) Maintaining clamp
(4) 2 elongated holes Ø 3.5 mm x 6.5 mm / Ø 0.13 in. x 0.25 in.
(5) 2 bus jumpers

Connections and Schema

Wiring Diagram

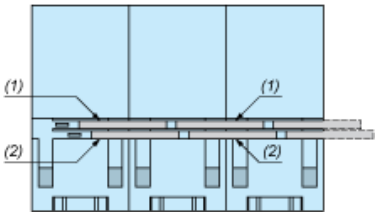


Symbols shown in blue correspond to Nema marking.

Connections and Schema

Bus Jumpers Mounting on Sockets with Separate Contacts

Example of RXZS2 bus jumper mounting on sockets (view from below)



(1) 2 bus jumpers (polarity A2)
(2) 2 bus jumpers (polarity A1)

Non-Fused Disconnect Switches
Series DS2

c3controls offers the most rugged, dependable Disconnect Switches that money can buy. From Panel/Base Mount to Door Mount with switch ratings from 16A - 125A, we've got what you need. And, of course, they're all certified to UL and CSA standards and CE marked for global versatility.

Conformity to Standards:
UL 508
CSA C22.2 No. 14
IEC 60947-1, 60947-3

Certifications:
UL File #: E187641 (Guide NLRV2, NLRV8, NLRV)
CSA File #: 232541
CE Marked (per EU Low Voltage Directive 73/23/EEC and 93/68/EEC)

IT'S EASY TO BUILD YOUR OWN DISCONNECT SWITCH

Simply pick the code number from each of the sections below and combine them to build your part number. See page 1 for more detailed directions.

Series DS2 Disconnect Switches (Non-Fused)

	DS2 –			–			
I	II	III	IV	V	VI	VII	

Example: To build one of our most popular Disconnect Switches, the part number would be I + DS2 + III + IV + V + VI + VII or DDS2-325-DHGRY

I. INSTALLATION

CODE	DESCRIPTION	LIST
D	Door Mount	$13.50
P	Panel/Base Mount	$15.00

II. BASIC DISCONNECT SWITCH OPERATOR

CODE	DESCRIPTION
DS2	Non-Fused Disconnect Switch

III. NUMBER OF POWER POLES

IV. CURRENT RATING

CODE	DESCRIPTION	3	4	5
		3 Poles	4 Poles	5 Poles
16	16 Amp	—	$ 7.00	$ 14.00
25	25 Amp	$ 2.00	$ 9.00	$ 16.00
30	32 Amp	$ 5.25	$13.25	$ 21.25
40	40 Amp	$ 7.00	$15.50	$ 24.00
60	63 Amp	$10.00	$19.50	$ 29.00
80	80 Amp	$19.00	$30.00	$ 41.00
100	100 Amp	$21.00	$32.50	$ 44.00
125	125 Amp	$26.00	$38.00	$ 50.00

DISCOUNT SCHEDULE C

V. OPERATING HANDLE TYPE

CODE	DESCRIPTION	FOR CURRENT RATING CODES	LIST
	DOOR MOUNT HANDLES FOR DOOR MOUNT SWITCHES		
MDHG	Padlockable Lever (IP55)	16	$ 4.50
MSDHG	Padlockable Lever - Single Hole (22.5mm) Mounting (IP55)	16	$ 4.50
DHM	Round (Type 1, 2, 3, 3R, 4/4X, 12, 13, and IP65)	25 ~ 60	$ 15.50
DHG	Round (Type 1, 2, 3, 3R, 4/4X, 12, 13, and IP65)	25 ~ 60	$ 5.25
	DOOR MOUNT HANDLES FOR PANEL/BASE MOUNT SWITCHES		
MPHG	Padlockable Lever (IP65)	16	$ 4.50
PHM	Round (Type 1, 2, 3, 3R, 4/4X, 12, 13, and IP65)	25 ~ 125	$ 15.50
PHG	Round (Type 1, 2, 3, 3R, 4/4X, 12, 13, and IP65)	25 ~ 125	$ 5.25
SPH	Short Pistol (IP65)	25 ~ 125	$ 20.00
LPH	Long Pistol (IP65)	80 ~ 125	$ 25.00
	INTEGRAL HANDLES FOR PANEL/BASE MOUNT SWITCHES		
SML	Lever (IP30)	25 ~ 60	$ 4.00
SMP	Padlockable Lever (IP30)	25 ~ 60	$ 4.50

VI. OPERATING HANDLE COLOR

CODE	OPERATOR COLOR	BEZEL COLOR	FOR OPERATOR TYPE CODE
RY	Red	Yellow	DHM, DHG, PHM, PHG, MDHG, MSDHG, MPHG, SMP
GB	Grey	Black	DHM, PHM
BB	Black	Black	DHM, PHM
BG	Black	Grey	DHM, DHG, PHM, PHG, MDHG, MSDHG, MPHG
BA	Black	Aluminum	SML
BN	Black	—	SPH, LPH

VII. OPERATING SHAFT LENGTH

CODE	DESCRIPTION	FOR CURRENT RATING CODES	LIST
(Blank)	Door Mount and Panel/Base Mount Switch with Integral Operating Handle	—	—
06	150mm (5.9") Operating Shaft for Panel/Base Mount Switch	16	$ 2.50
11	283mm (11.1") Operating Shaft for Panel/Base Mount Switch	25 ~ 125	$ 3.25

16A Door and Panel Mount and 80-125A Door Mount Available March '07.

Panel Mount Disconnect Switch with PHG Handle

Door Mount Disconnect Switch with DHG Handle

Panel Mount Disconnect Switch with Integral SMP Handle

Panel Mount Disconnect Switch with Integral SML Handle

Series DS2 IEC Non-Fused Disconnect Switches

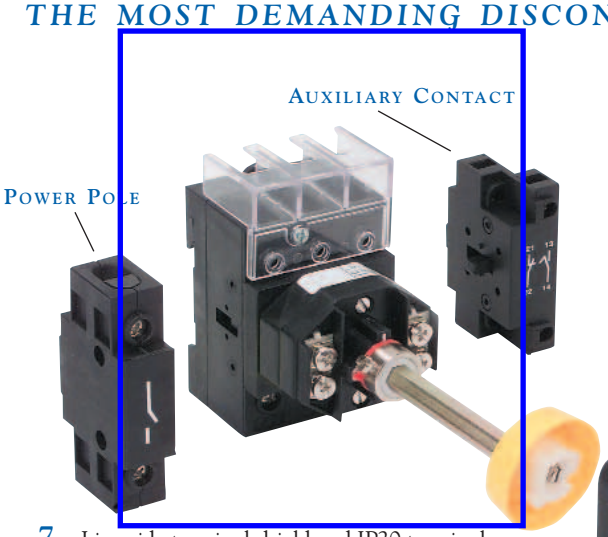
Our Series DS2 IEC Non-Fused Disconnect Switches provide superior performance in rugged applications and are certified as Manual Motor Controllers Suitable as Motor Disconnects for motors up to 40HP at 480V (45kW at 400V). Panel/Base and door mounting options allow switches to be installed in virtually any enclosure.

Panel/Base mount switches are simple to install:

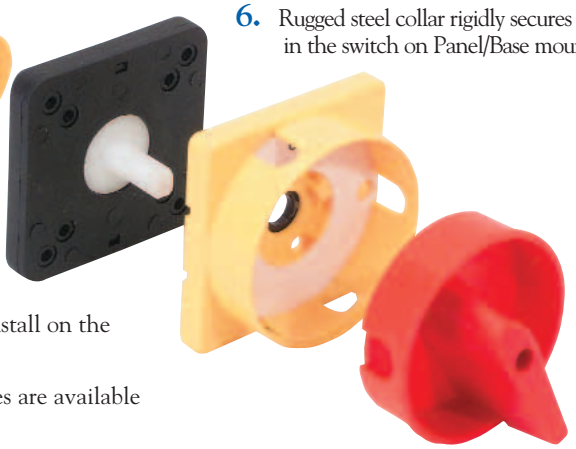
- Snap-on to a 35mm DIN rail.
- Secure to the panel with two (2) fixing screws.
- Dual terminal markings (1/L1, 3/L2, 5/L3 and 2/T1, 4/T2, 6/T3) for fast and easy wiring.

NEW EXPANDED PRODUCT OFFERING!

Compact size with robust design features for the most demanding disconnecting applications.



1. 10kA short circuit rating at 600V AC with Class J and Class CC fuses.
2. Positive drive to open double break contacts to ensure circuit isolation.
3. Compact space saving design for reduced size control panels. 16A switch is only 43mm wide and our 25A ~ 63A switches are only 50mm wide.
4. Wide variety of operating handle styles and colors with Type 1, 2, 3, 3R, 4/4X, 12 and 13, IP55, and IP65 ingress protection ratings for the most demanding industrial environments.
5. Glass filled polyamide thermoplastic housings are ARC track resistant and provide insulation between poles.
6. Rugged steel collar rigidly secures the operating shaft in the switch on Panel/Base mounted switches.



7. Line side terminal shield and IP20 terminals guard against accidental contact with live parts.
8. Integral captive terminal clamps are shipped in the backed-out position for easy wiring and are plated for corrosion resistance.
9. Auxiliary contacts, power poles, and neutral poles install on the left or right side of the switch.
10. Complete assembled switches with operating handles are available for JIT manufacturing and reduced inventory.

Some of Our Popular Configurations:

SERIES DS2 IEC NON-FUSED DISCONNECT SWITCHES

CATALOG NUMBER	DESCRIPTION	LIST
DDS2-316-MDHGRY	16A Door Mount Disconnect Switch w /3 Poles and Lever Red/Yellow Handle	$18.75
DDS2-325-DHGRY	25A Door Mount Disconnect Switch w/3 Poles and Round Red/Yellow Handle	$20.75
DDS2-330-DHGRY	32A Door Mount Disconnect Switch w/3 Poles and Round Red/Yellow Handle	$24.00
DDS2-340-DHGRY	40A Door Mount Disconnect Switch w/3 Poles and Round Red/Yellow Handle	$25.75
PDS2-316-MPHGRY06	16A Panel Mount Disconnect Switch w /3 Poles and Lever Red/Yellow Handle	$22.00
PDS2-325-PHGRY11	25A Panel Mount Disconnect Switch w/3 Poles and Round Red/Yellow Handle	$25.50
PDS2-330-PHGRY11	32A Panel Mount Disconnect Switch w/3 Poles and Round Red/Yellow Handle	$28.75
PDS2-340-PHGRY11	40A Panel Mount Disconnect Switch w/3 Poles and Round Red/Yellow Handle	$30.50
PDS2-325-SMLBA	25A Panel Mount Disconnect Switch w/3 Poles and Integral Black/Aluminum Lever Handle	$21.00
PDS2-325-SMPRY	25A Panel Mount Disconnect Switch w/3 Poles and Integral Red/Yellow Padlockable Lever Handle	$21.50
PDS2-330-SMLBA	32A Panel Mount Disconnect Switch w/3 Poles and Integral Black/Aluminum Lever Handle	$24.25

SERIES DS2 IEC NON-FUSED OPERATING HANDLES

c3controls Series DS2 IEC non-fused disconnect switch operating handles are available in a wide variety of styles, colors, and ingress protection ratings — perfect for any application from light duty to severe industrial environments. External operating handles are easy to install in standard 5-hole panel drilling layouts. A single hole (22.5mm) operating handle is also available for 16A switches. Operating handles can be installed in enclosures with door thicknesses up to 5mm (3/16").

UNIQUE PRODUCT FEATURES

EASY TO INSTALL, STYLISH OPERATING HANDLES PROVIDE RELIABLE ACTUATION IN DISCONNECTING APPLICATIONS AND CAN BE LOCKED OFF FOR EXTRA SAFETY.

1. Handles can be padlocked off with up to three padlocks to meet global installation codes and standards requirements.
2. Operating handles with ON/OFF and I/O markings.
3. Door interlock — can only be opened in the OFF position.
4. Positive, reliable actuation of the switch is ensured through the rigid steel operating shaft that can be cut to length for enclosure depths up to 204mm (8.0") for 16A switches and up to 355mm (13.98") for 25A ~ 125A switches.

DHG/PHG DOOR/PANEL MOUNT ROUND OPERATING HANDLE
(Type 1, 2, 3, 3R, 4/4X, 12, 13, and IP65)

DHM/PHM DOOR/PANEL MOUNT OPERATING HANDLE
(Type 1, 2, 3, 3R, 4/4X, 12, 13, and IP65)

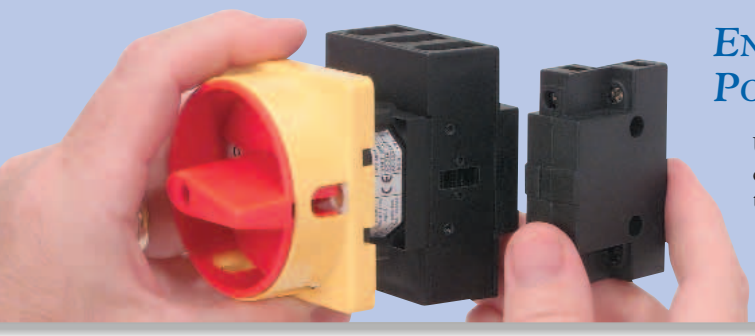
SMP PANEL MOUNT INTEGRAL PADLOCKABLE LEVER OPERATING HANDLE
(IP30)

SPH/LPH PANEL MOUNT PISTOL OPERATING HANDLE
(IP65)

SML PANEL MOUNT INTEGRAL LEVER OPERATING HANDLE
(IP30)

MDHG/MPHG DOOR/PANEL MOUNT LEVER OPERATING HANDLE
(IP55)

SPECIAL FEATURES



Engineered to add Auxiliary Contacts, Power Poles, and Neutral Poles Easily!

Up to two modules (Auxiliary Contacts, Power Poles, and Neutral Poles) can be added to a three pole switch. One module can be installed on the left side and right side of the switch.

NEUTRAL POLE MODULES

Normally open early make (NOEM) configuration. IP20 terminals guard against accidental contact with live parts.

DOOR MOUNT		
CODE	CURRENT RATING CODE	LIST
DNA216	16	$ 7.00
DNA225	25	$ 7.00
DNA230	30	$ 8.00
DNA240	40	$ 8.50
DNA260	60	$ 9.50
DNA280	80	$ 11.00
DNA2100	100	$ 11.50
DNA2125	125	$ 12.00

PANEL MOUNT		
CODE	CURRENT RATING CODE	LIST
PDNA216	16	$ 7.00
PDNA225	25	$ 7.00
PDNA230	30	$ 8.00
PDNA240	40	$ 8.50
PDNA260	60	$ 9.50
PDNA280	80	$ 11.00
PDNA2100	100	$ 11.50
PDNA2125	125	$ 12.00

DISCOUNT SCHEDULE C

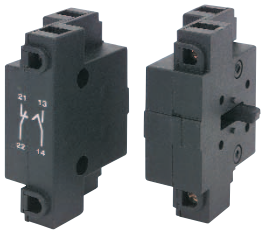
POWER POLE MODULES

Normally open (NO) configuration. IP20 terminals guard against accidental contact with live parts. Electrical ratings are equivalent to the associated switch rating (refer to specifications on page 8).

DOOR MOUNT		
CODE	CURRENT RATING CODE	LIST
DPA216	16	$ 7.00
DPA225	25	$ 7.00
DPA230	30	$ 8.00
DPA240	40	$ 8.50
DPA260	60	$ 9.50
DPA280	80	$11.00
DPA2100	100	$11.50
DPA2125	125	$12.00

PANEL MOUNT		
CODE	CURRENT RATING CODE	LIST
PDPA216	16	$ 7.00
PDPA225	25	$ 7.00
PDPA230	30	$ 8.00
PDPA240	40	$ 8.50
PDPA260	60	$ 9.50
PDPA280	80	$11.00
PDPA2100	100	$11.50
PDPA2125	125	$12.50

AUXILIARY CONTACT MODULES



1 normally open early make (NOEM) and 1 normally closed (NC) contact configuration. IP20 terminals guard against accidental contact with live parts. Auxiliary contacts can be installed on switches rated 16A to 125A, reducing inventory requirements.

Ratings: AC-15: 6A at ≤240V AC
4A at 240V AC to 480V AC
Continuous Thermal Current: 15A

DOOR MOUNT		
CODE	CURRENT RATING CODE	LIST
D16A211	16	$ 11.00
DA211	25 ~ 60	$ 11.00
D125A211	80 ~ 125	$ 11.00

PANEL MOUNT		
CODE	CURRENT RATING CODE	LIST
PA16DA211	16	$ 11.00
PADA211	25 ~ 60	$ 11.00
PA125DA211	80 ~ 125	$ 11.00

TERMINAL SHIELDS

Terminal shields can be installed on the line or load side of the disconnect switch to provide extra protection and guard against accidental contact with live parts.

CODE	CURRENT RATING CODE	LIST
DS2TS60	25 ~ 60	$2.00
DS2TS125	80 ~ 125	$4.00

SPECIFICATIONS:

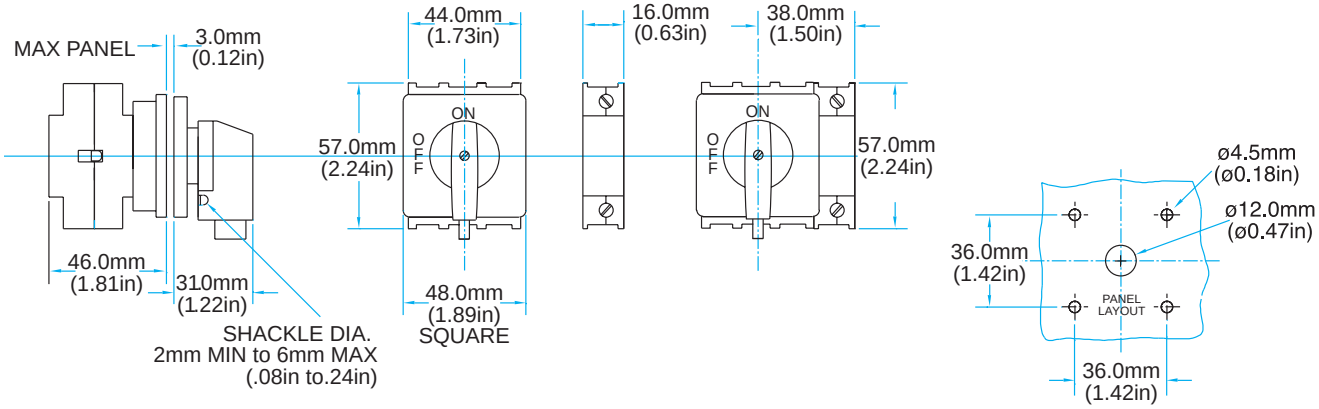
SERIES DS2 IEC NON-FUSED DISCONNECT SWITCH SPECIFICATIONS

		SWITCH CURRENT RATING CODE							
		16	25	30	40	60	80	100	125
ELECTRICAL UL/CSA APPLICATIONS									
	UNITS								
Rated Operating Voltage, Ue	VAC	600							
Rated Operating Current, Ie	A	16	25	32	40	63	80	100	125
RATED 3-PHASE POWER, Pe									
@ 240V AC	HP	3	7.5	7.5	10	15	10	15	15
@ 480V AC	HP	7.5	15	20	20	25	30	30	40
@ 600V AC	HP	10	20	25	30	30	40	40	50
RATED SINGLE PHASE POWER, Pe									
@ 120V AC	HP	0.5	1.5	2	3	3	3	3	3
@ 240V AC	HP	1.5	2	3	4	7.5	7.5	7.5	10
SHORT CIRCUIT RATINGS @ 600V AC									
With Class J and CC Fuses	kA	10	10	10	10	10	10	10	10
Maximum Fuse Size	A	20	45	45	70	70	90	90	90
ELECTRICAL IEC APPLICATIONS									
Rated Insulation Voltage, Ui	VAC	750							
Rated Impulse Voltage, Uimp	kV	6							
Rated Operating Voltage, Ue	VAC	690							
RATED OPERATING CURRENT, Ie									
AC-21A	A	16	25	32	40	63	80	100	125
AC-1	A	20	32	40	63	80	80	100	125
RATED 3-PHASE POWER, AC-23A, Pe									
@ 220 ~ 240V AC	kW	3	5.5	7.5	11	15	18.5	22	30
@ 380 ~ 440V AC	kW	5.5	11	15	18.5	30	30	37	45
@ 500 ~ 690V AC	kW	7.5	11	15	22	30	37	45	55
RATED 3-PHASE POWER, AC-3, Pe									
@ 220 ~ 240V AC	kW	2	4	5.5	7.5	11	15	18.5	22
@ 380 ~ 440V AC	kW	3	7.5	11	18.5	22	22	30	37
@ 500 ~ 690V AC	kW	5.5	11	11	18.5	22	30	37	45
SHORT CIRCUIT RATINGS									
With Type gL Fuses	kA	5	30	30	30	30	30	30	30
Maximum Fuse Size	A	16	25	32	40	63	80	100	125
MECHANICAL									
Operating Torque (Door Mount)	Nm	①	0.8	0.8	0.8	0.8	①	①	①
	Lb-in.	①	7	7	7	7	①	①	①
Operating Torque (Panel Mount)	Nm	①	1.0	1.0	1.0	1.0	1.6	1.6	1.6
	Lb-in.	①	9	9	9	9	14	14	14
ENVIRONMENTAL									
Ambient Operating Temperature	°C/°F	-25 to 55° C (-13 to 131° F)							
Altitude	m/ft.	2,000/6,528							
Ingress Protection									
Switch Body	IP	20							
Operating Handles	—	IP55, IP65	Type 1, 2, 3, 3R, 4/4X, 12 and 13 (refer to specific handle catalog numbers). IP65 and IP30 (refer to specific handle catalog numbers).						
CONSTRUCTION									
CONDUCTOR SIZE									
UL/CSA	AWG	12	8	8	6	6	1	1	1
Solid/Multi-strand	mm^2	1.5 ~ 6	1 ~ 10	1 ~ 10	4 ~ 16	4 ~ 16	6 ~ 70	6 ~ 70	6 ~ 70
Fine strand with sleeve	mm^2	0.5 ~ 6	0.75 ~ 6	0.75 ~ 6	2.5 ~ 10	2.5 ~ 10	4 ~ 50	4 ~ 50	4 ~ 50
Terminal Torque	Nm	0.8	1.7	1.7	1.7	1.7	2.5	2.5	2.5
	Lb-in.	7.1	15	15	15	15	22	22	22

①Consult factory

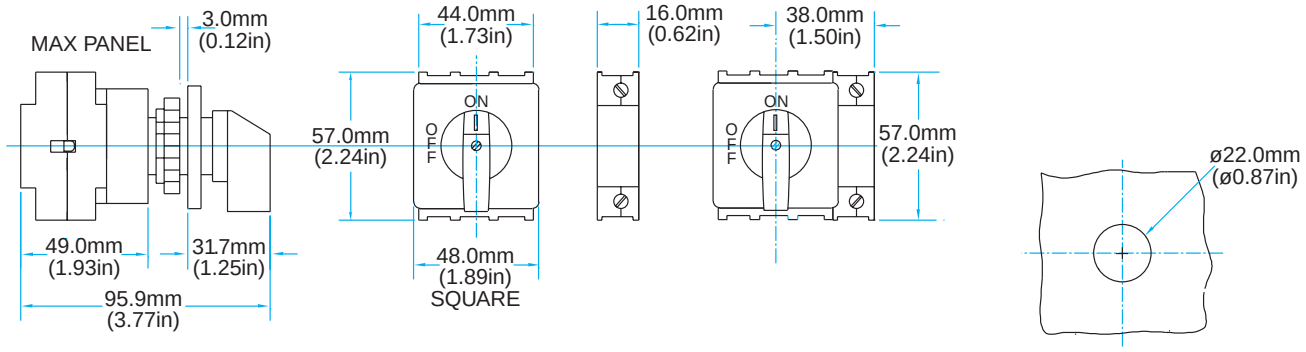
DOOR MOUNTED DISCONNECT SWITCH WITH MDHG OPERATING HANDLE

16A Switches



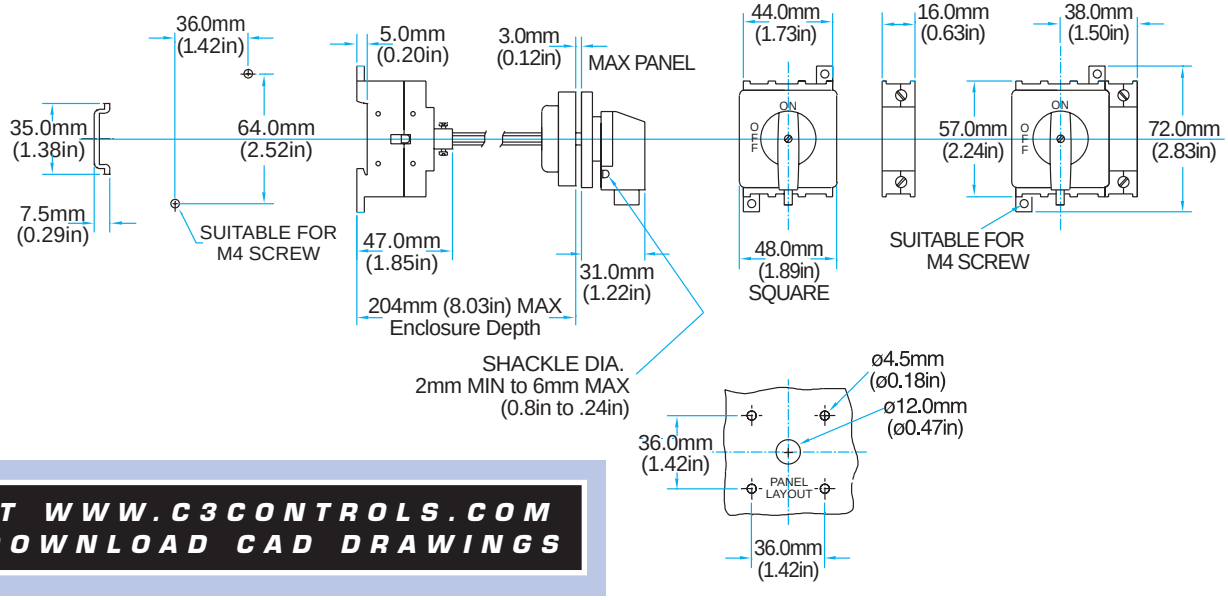
DOOR MOUNTED DISCONNECT SWITCH WITH MSDHG OPERATING HANDLE

16A Switches



PANEL MOUNTED DISCONNECT SWITCH WITH MPHG OPERATING HANDLE

16A Switches



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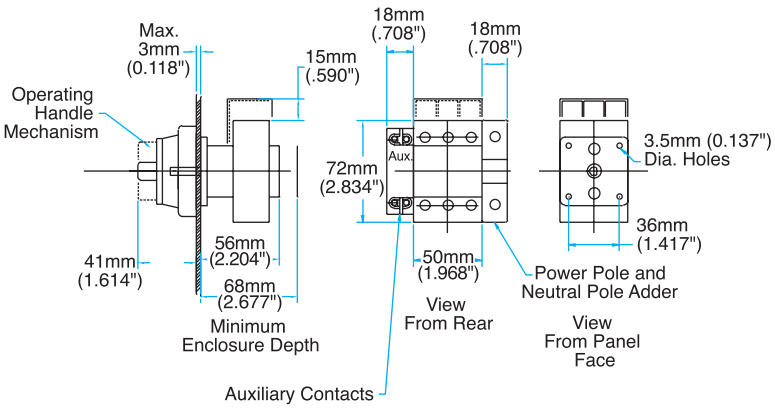
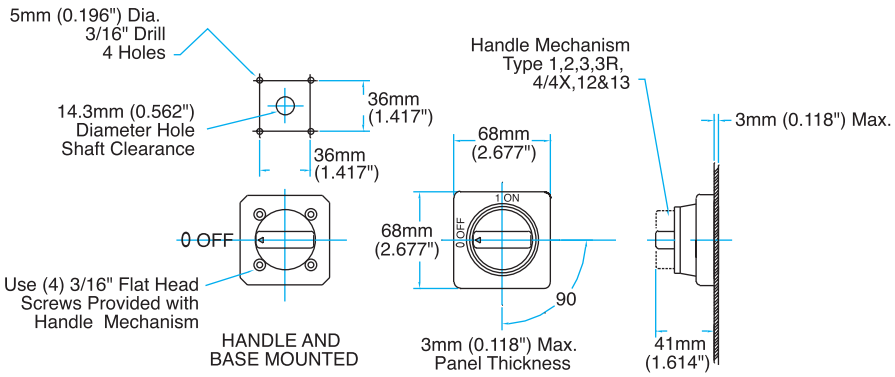
DOOR MOUNTED DISCONNECT SWITCH WITH DHM OPERATING HANDLE

25A - 63A Switches

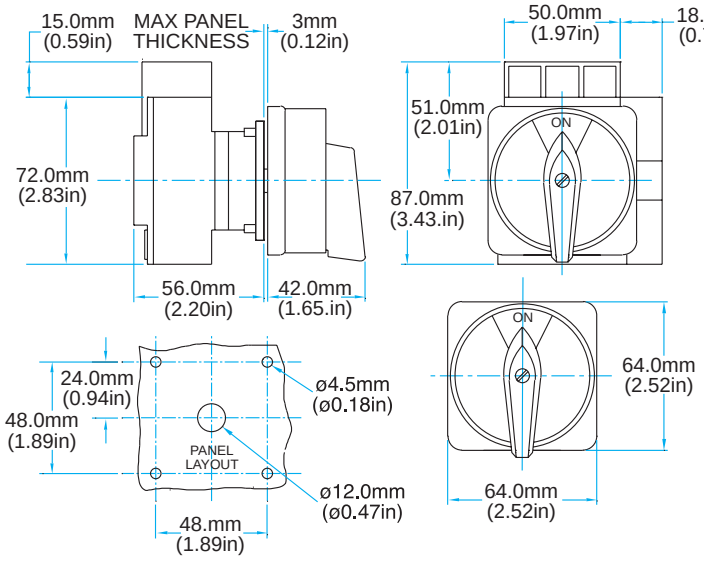


DHM Operating Handle Mounting Hole Pattern

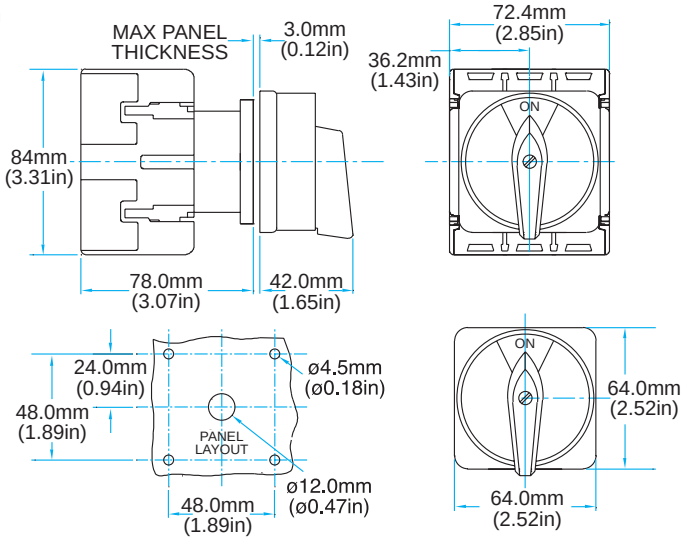


DOOR MOUNTED DISCONNECT SWITCH WITH DHG OPERATING HANDLE

25A - 63A Switches

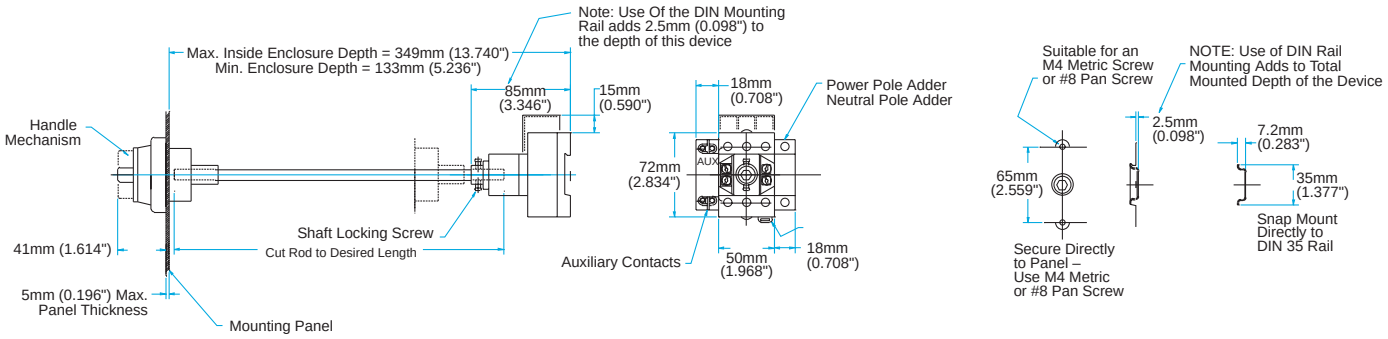


80A - 125A Switches

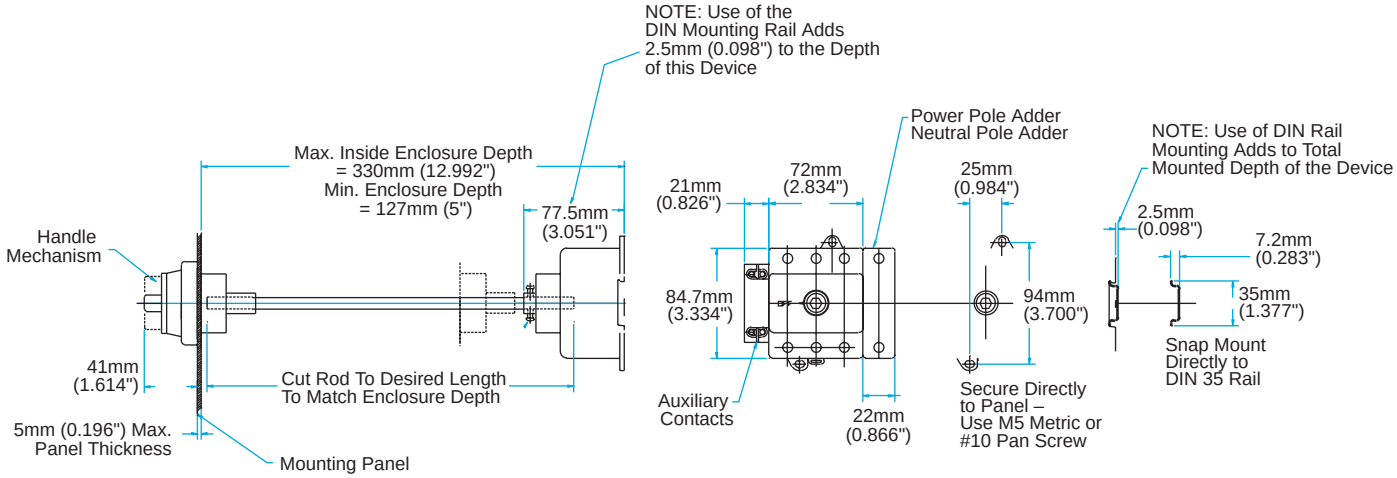


PANEL MOUNTED DISCONNECT SWITCHES WITH PHM OPERATING HANDLES

25A - 63A Switches

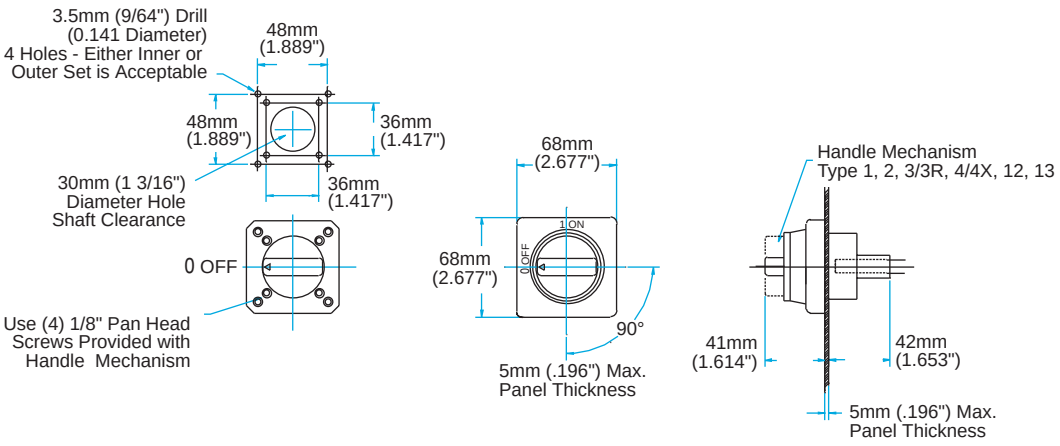


80A - 125A Switches



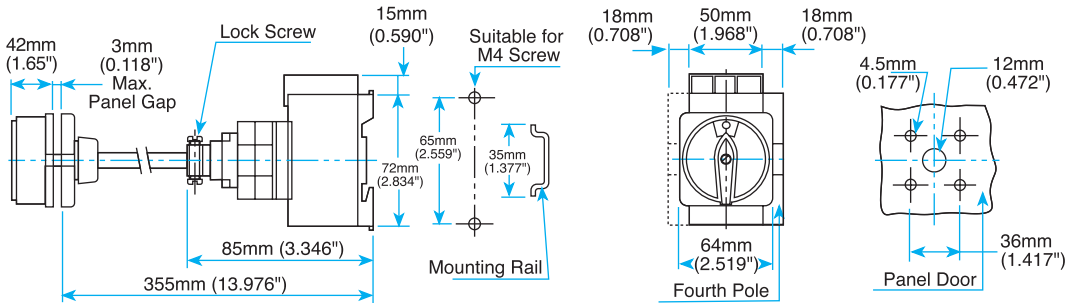
PHM Operating Handle Mounting Hole Pattern

For 25A-63A and 80A-125A

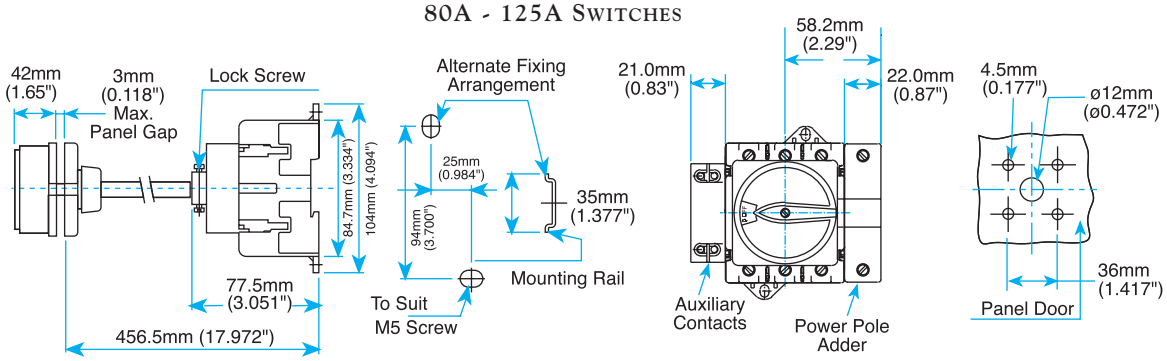


PANEL MOUNTED DISCONNECT SWITCHES WITH PHG OPERATING HANDLES

25A - 63A Switches

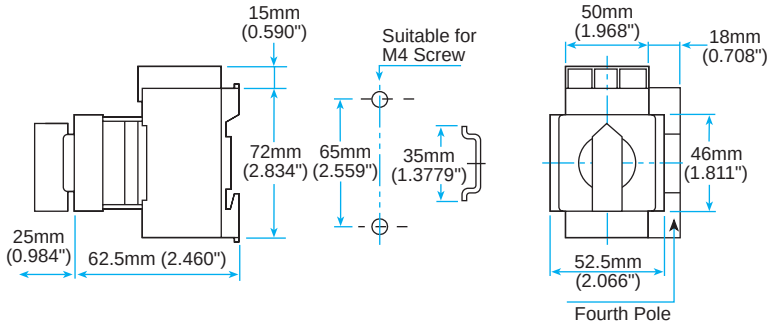


80A - 125A Switches



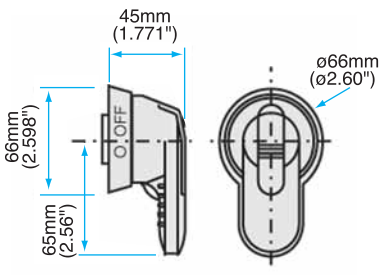
PANEL MOUNTED DISCONNECT SWITCH WITH SML OPERATING HANDLE

25A - 63A Switches

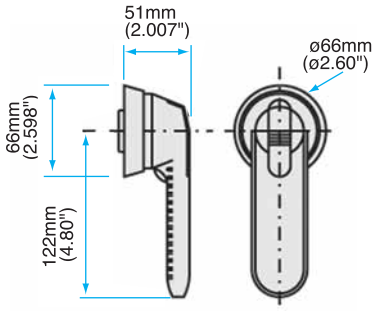


SPH & LPH OPERATING HANDLES FOR PANEL MOUNTED DISCONNECT SWITCHES

SPH



LPH



Product Data Sheet

MARATHON SPECIAL PRODUCTS
A REGAL-BELOIT Company

GL02

Grounding Lug
Part No: 9807052

Screw is GREEN: Universal color for grounding

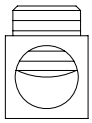
Wire Range:
#2 - #14 AWG Cu Wire
#2 - #12 AWG Al Wire

See tables below for Flexible stranded approvals.

Electrical Ratings:
• 115A copper wire, 90A aluminum wire (Based on NEC Table 310-16, 75°C columns)

Materials:
• Connector: High conductivity aluminum, tin plated
• Terminal screws: Steel, nickel plated – painted green

Agency Approvals:
• UL Recognized, UL, File No. ZMVV2.E43665
• CSA Certified, CSA File No. 63510-25 (Wire Classes B & C only)
• RoHS Compliant



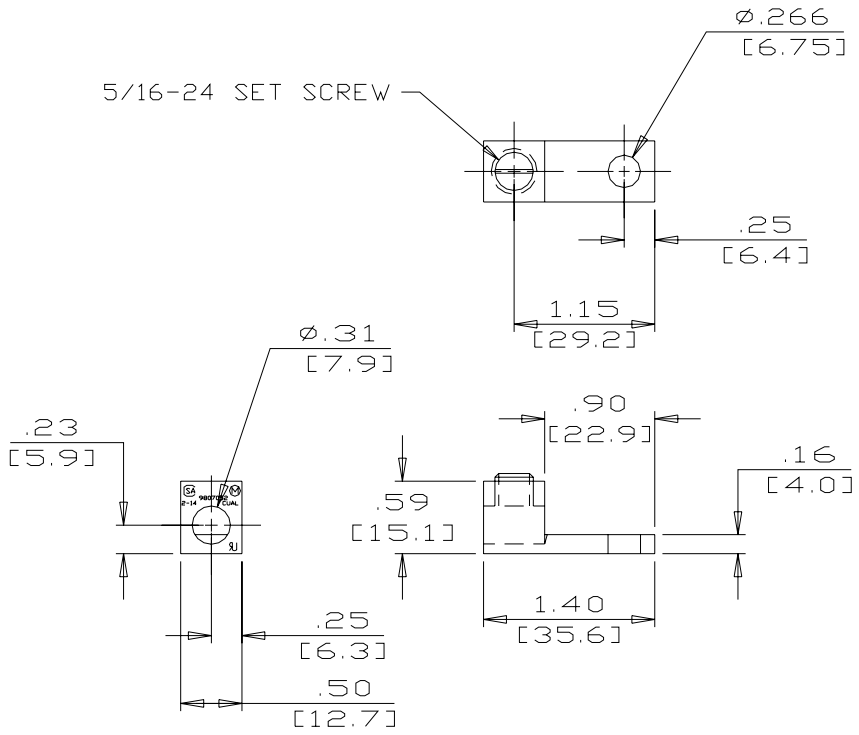
Wire Range:

		Copper Wire Stranding Classes - Number of Strands						
Wire Size	Torque	Solid	Class B	Class C	Class G	Class H	Class I	Class K
2 AWG	50 in. lbs		7	19				
4	45 in. lbs		7	19	~ 49	~ 133	~ 105	~ 420
6	45 in. lbs		7	19	~ 49	~ 133	~ 63	~ 266
8	40 in. lbs		(1-2)* 7	(1-2)* 19	~ 49	~ 133	(1-2)* ~ 41	(1-2)* ~ 168
10	35 in. lbs	1	(1-2)* 7	(1-2)* 19			(1-2)* ~ 27	(1-2)* ~ 104
12	35 in. lbs	1	(1-4)* 7	(1-4)* 19			(1-2)* ~ 19	(1-2)* ~ 65
14	35 in. lbs	1	(1-4)* 7	(1-4)* 19			(1-2)* ~ 19	(1-2)* ~ 41

~Quantity of strands for Classes G, H, I, K may vary by manufacturer.
* Numbers in parenthesis indicate multiple conductor approvals

Aluminum stranded wire range: #2 – #12 AWG

- Slotted Screw
- Wire strip length – 9/16”
- Panel mountable: 1/4” (M6) fastener, torque to 6 ft. lbs. (8 N-m)
- Lock washer and flat washer recommended with mounting bolt



WWW.MARATHONSP.COM
1-419-352-8441

ATQR

TIME DELAY/CLASS CC

TAKE *CONTROL* OF FAULT CURRENTS HEADED FOR YOUR *CONTROL* TRANSFORMER

ATQR small-dimension fuses feature time delay characteristics ideally suited for the high inrush currents of control transformers, solenoids, and similar inductive loads. The newest member of our Amp-trap 2000® family of fuses - ATQR fuses provide superior protection for the branch circuits of electrical distribution systems.

Features/Benefits

- **Time delay** for control transformer inrush loads without nuisance opening
- **Highly current limiting** for low peak let-thru current
- **Rejection-style design** prevents replacement errors (when used with recommended fuse blocks)
- **High-visibility orange label** ensures instant recognition, and simplifies replacement
- **Metal-embossed date and catalog number** for traceability and lasting identification
- **Fiberglass body** provides dimensional stability in harsh industrial settings
- **High-grade silica filler** ensures fast arc quenching and high current limitation

HIGHLIGHTS:

- Time Delay
- Best Choice for Small Transformer Protection
- Most Current-Limiting

APPLICATIONS:

- Control Transformers
- Solenoids
- Inductive Loads
- Lighting, Heating & General-purpose Loads

Ratings

- **AC:** 1/10 to 30A 600VAC, 200kA I.R.
- **DC:** 1/10 to 30A300VDC, 100kA I.R.

Approvals

- UL Listed to Standard 248-4
- DC Listed to UL Standard 248
- CSA Certified to Standard C22.2 No. 248.4

TIME DELAY/CLASS CC FUSES

Standard Fuse Ampere Ratings, Catalog Numbers

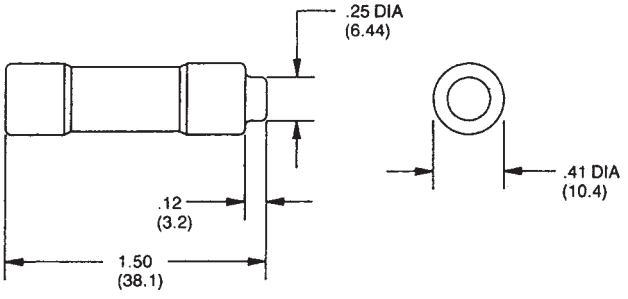
AMPERE RATING	CATALOG NUMBER	AMPERE RATING	CATALOG NUMBER	AMPERE RATING	CATALOG NUMBER	AMPERE RATING	CATALOG NUMBER
1/10	ATQR1/10	8/10	ATQR8/10	2-8/10	ATQR2-8/10	7-1/2	ATQR7-1/2
1/8	ATQR1/8	1	ATQR1	3	ATQR3	8	ATQR8
3/16	ATQR3/16	1-1/8	ATQR1-1/8	3-2/10	ATQR3-2/10	9	ATQR9
2/10	ATQR2/10	1-1/4	ATQR1-1/4	3-1/2	ATQR3-1/2	10	ATQR10
1/4	ATQR1/4	1-4/10	ATQR1-4/10	4	ATQR4	12	ATQR12
3/10	ATQR3/10	1-1/2	ATQR1-1/2	4-1/2	ATQR4-1/2	15	ATQR15
4/10	ATQR4/10	1-6/10	ATQR1-6/10	5	ATQR5	17-1/2	ATQR17-1/2
1/2	ATQR1/2	1-8/10	ATQR1-8/10	5-6/10	ATQR5-6/10	20	ATQR20
6/10	ATQR6/10	2	ATQR2	6	ATQR6	25	ATQR25
3/4	ATQR3/4	2-1/4	ATQR2-1/4	6-1/4	ATQR6-1/4	30	ATQR30
		2-1/2	ATQR2-1/2	7	ATQR7		

Recommended ATQR Class CC Primary Fuses For Single Phase Control Transformers

TRANS VA	PRIMARY VOLTS	PRIMARY FLA	ATQR AMPS
25	600	0.04	1/10
	480	0.05	1/10
	240	0.10	2/10
	208	0.12	1/4
	120	0.21	4/10
50	600	0.08	1/4
	480	0.10	1/4
	240	0.21	4/10
	208	0.24	1/2
	120	0.42	6/10
75	600	0.13	1/4
	480	0.16	3/10
	240	0.31	1/2
	208	0.36	3/4
	120	0.63	1
100	600	0.17	3/10
	480	0.21	4/10
	240	0.42	6/10
	208	0.48	1
	120	0.83	1-1/2
150	600	0.25	1/2
	480	0.31	1/2
	240	0.63	1
	208	0.72	1-1/2
	120	1.25	2-1/2
200	600	0.33	1/2
	480	0.42	6/10
	240	0.83	1-1/2
	208	0.96	2
	120	1.67	3
250	600	0.42	6/10
	480	0.52	1-1/8
	240	1.04	2
	208	1.2	3
	120	2.08	4*

TRANS VA	PRIMARY VOLTS	PRIMARY FLA	ATQR AMPS
300	600	0.50	1-1/8
	480	0.63	1-1/2
	240	1.25	2-1/2
	208	1.44	3
	120	2.5	5*
500	600	0.83	1-1/2
	480	1.04	2
	240	2.08	4*
	208	2.40	6*
	120	4.17	10*
750	600	1.25	2-1/2
	480	1.56	3
	240	3.13	7*
	208	3.61	8*
	120	6.25	15*
1000	600	1.67	3
	480	2.08	4*
	240	4.16	10*
	208	4.81	12*
	120	8.33	20*
1500	600	2.50	5*
	480	3.13	7*
	240	6.25	10
	208	7.21	20*
	120	12.5	25*
2000	600	3.33	8*
	480	4.17	10*
	240	8.33	20++*
	208	9.62	20++*
3000	600	5.00	12+*
	480	6.25	15+*
	240	12.5	30++*
5000	600	8.33	20++*
	480	10.4	25+*

Dimensions



Recommended Fuse Blocks for Class CC Fuses

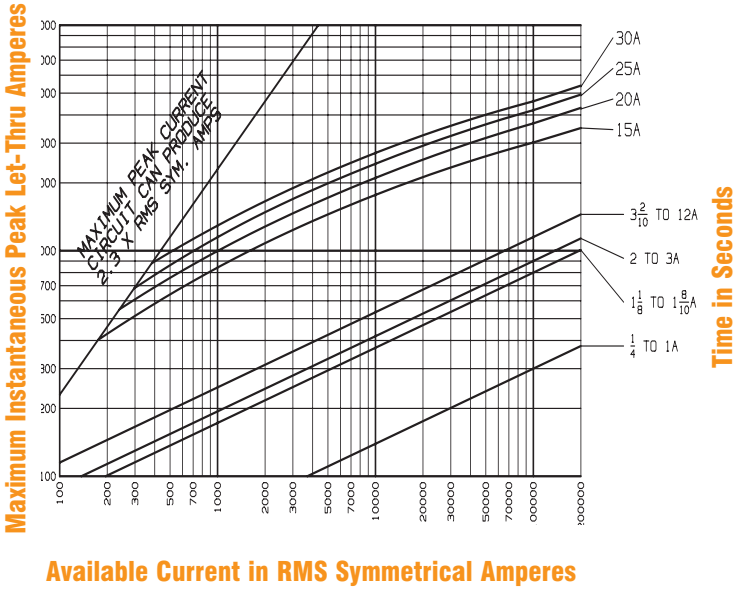
Number of Poles	ULTRASAFE™ Indicating Fuse Holder	Screw with Double Quick Connects	Pressure Plate with Double Quick Connects	Copper Box Connector
ADDER		30310R	30320R	30350R
1	USCC1I	30311R	30321R	30351R
2	USCC2I	30312R	30322R	30352R
3	USCC3I	30313R	30323R	30353R

Primary fuses - If primary FLA is less than 2 amps, fuse may be 300% max. (500% for motor control). If primary FLA exceeds 2 amps but is less than 9 amps, fuse may not exceed 167% of primary FLA unless secondary protection is used, when it may be increased to 250%. Fuse sizes shown are based on approx. 40 x FLA for .01 sec.

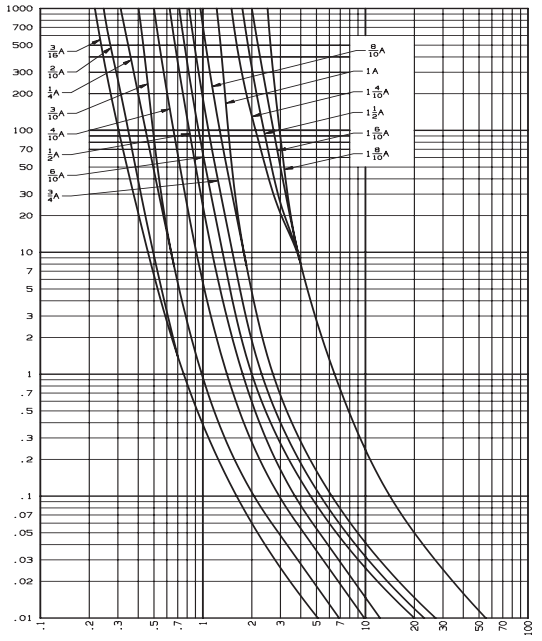
* Secondary protection is required for these ratings.
\+ Fuse will withstand 30 x FLA for .01 second
++ Fuse will withstand 25 x FLA for .01 second

TIME DELAY/CLASS CC FUSES

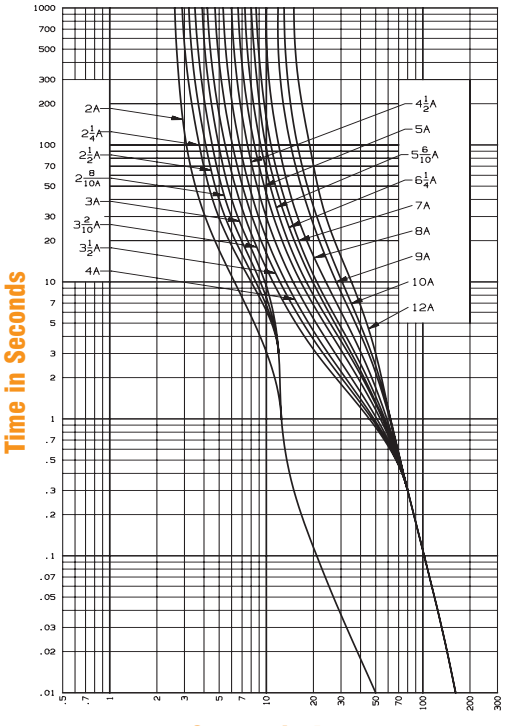
Peak Let-Thru Current Data–ATQR1/4 to 30, 600 Volts AC



Melting Time-Current Data ATQR 3/16 to 1-8/10, 600 Volts



Melting Time-Current Data ATQR 2 to 30, 600 Volts AC



Product data sheet
Characteristics

9001SKT38LGG31
PILOT LIGHT 120V 30MM SK +OPTIONS

Product availability : Stock - Normally stocked in distribution facility

Price* : 197.00 USD

Main

Range of product	Harmony 9001SK
Product or component type	Illuminated push to test push-button
Device short name	9001SK
Type of operator	Spring return
Operator profile	Green projecting unmarked

Complementary

Bezel material	Plastic
Mounting diameter	1.18 in (30 mm)
Shape of signaling unit head	Octagonal
Light source	LED
Light source	LED
Bulb base	BA 9s
Light block supply	Direct
[Us] rated supply voltage	120 V AC/DC
[Us] rated supply voltage	120 V AC/DC
Connections - terminals	Screw clamp terminals (1 x 0.22...2 x 1.5 mm²) conforming to EN/IEC 60947-1
Tightening torque	7.08 lbf.in (0.8 N.m) conforming to EN/IEC 60947-1
Shape of screw head	Cross slotted
Mechanical durability	5000000 cycles
Operating position	Any position
[Ie] rated operational current	0.55 A 125 V DC-13 A600-Q600 NEMA
[Ui] rated insulation voltage	250 V (degree of pollution: 3) conforming to EN/IEC 60947-1
[Uimp] rated impulse withstand voltage	2.5 kV conforming to EN/IEC 60947-1
Contacts material	Silver alloy contacts
Positive opening	Without
Short-circuit protection	10 A cartridge fuse conforming to EN/IEC 60947-5-1

[Ith] conventional free air thermal current	10 A
[Icm] rated short-circuit making capacity	<= 12 kA at 600 V (AC-15) 7200 VA <= 15 kA at 480 V (AC-15) 7200 VA <= 30 kA at 240 V (AC-15) 7200 VA <= 60 kA at 120 V (AC-15) 7200 VA
Rated breaking capacity	<= 0.1 kA at 600 V (DC-13) <= 0.27 kA at 250 V (DC-13) <= 0.55 kA at 125 V (DC-13) <= 1.2 kA at 600 V (AC-15) 720 VA <= 1.5 kA at 480 V (AC-15) 720 VA <= 3 kA at 240 V (AC-15) 720 VA <= 6 kA at 120 V (AC-15) 720 VA
Product weight	0.43 lb(US) (0.195 kg)
Device presentation	Complete product

Environment

Standards	EN/IEC 60947-1 EN/IEC 60947-5-1 EN/IEC 60947-5-4 CSA C22.2 No 14 JIS C 4520 UL 508 JIS C 852
Product certifications	NEMA UL 508
Protective treatment	TC
Ambient air temperature for storage	-40...158 °F (-40...70 °C)
Ambient air temperature for operation	-13...158 °F (-25...70 °C)
Vibration resistance	7 gn (f = 2...500 Hz) conforming to IEC 60068-2-6
Shock resistance	50 gn conforming to IEC 60068-2-27
Electrical shock protection class	Class II conforming to IEC 61140
IP degree of protection	IP66 conforming to IEC 60529
NEMA degree of protection	NEMA 1 NEMA 12 NEMA 13 NEMA 2 NEMA 3 NEMA 3R NEMA 4 NEMA 4X

Ordering and shipping details

Category	21429 - 9001 SK,SKY
Discount Schedule	CS1
GTIN	00785901044482
Nbr. of units in pkg.	1
Package weight(Lbs)	0.27000000000000002
Returnability	Y
Country of origin	MX

Offer Sustainability

RoHS (date code: YYWW)	Compliant - since 0921 - Schneider Electric declaration of conformity Schneider Electric declaration of conformity
REACh	Reference not containing SVHC above the threshold Reference not containing SVHC above the threshold

Contractual warranty

Warranty period	18 months

Product data sheet
Characteristics

9001SKT38LYA31
PILOT LIGHT 120V 30MM SK +OPTIONS

Product availability : Stock - Normally stocked in distribution facility

Price* : 197.00 USD

Main

Range of product	Harmony 9001SK
Product or component type	Illuminated push to test push-button
Device short name	9001SK
Type of operator	Spring return
Operator profile	Amber projecting unmarked

Complementary

Bezel material	Plastic
Mounting diameter	1.18 in (30 mm)
Shape of signaling unit head	Octagonal
Light source	LED
Light source	LED
Bulb base	BA 9s
Light block supply	Direct
[Us] rated supply voltage	120 V AC/DC
[Us] rated supply voltage	120 V AC/DC
Connections - terminals	Screw clamp terminals (1 x 0.22...2 x 1.5 mm²) conforming to EN/IEC 60947-1
Tightening torque	7.08 lbf.in (0.8 N.m) conforming to EN/IEC 60947-1
Shape of screw head	Cross slotted
Mechanical durability	5000000 cycles
Operating position	Any position
[Ie] rated operational current	0.55 A 125 V DC-13 A600-Q600 NEMA
[Ui] rated insulation voltage	250 V (degree of pollution: 3) conforming to EN/IEC 60947-1
[Uimp] rated impulse withstand voltage	2.5 kV conforming to EN/IEC 60947-1
Contacts material	Silver alloy contacts
Positive opening	Without
Short-circuit protection	10 A cartridge fuse conforming to EN/IEC 60947-5-1

[Ith] conventional free air thermal current	10 A
[Icm] rated short-circuit making capacity	<= 12 kA at 600 V (AC-15) 7200 VA <= 30 kA at 480 V (AC-15) 7200 VA <= 60 kA at 120 V (AC-15) 7200 VA
Rated breaking capacity	<= 0.27 kA at 250 V (DC-13) <= 0.55 kA at 125 V (DC-13) <= 1.2 kA at 600 V (AC-15) 720 VA <= 3 kA at 480 V (AC-15) 720 VA <= 6 kA at 120 V (AC-15) 720 VA
Product weight	0.43 lb(US) (0.195 kg)
Device presentation	Complete product
Compatibility code	9001SK

Environment

Standards	JIS C 4520 EN/IEC 60947-5-4 CSA C22.2 No 14 EN/IEC 60947-1 UL 508 JIS C 852 EN/IEC 60947-5-1
Product certifications	UL 508 NEMA
Protective treatment	TC
Ambient air temperature for storage	-40...158 °F (-40...70 °C)
Ambient air temperature for operation	-13...158 °F (-25...70 °C)
Vibration resistance	7 gn (f = 2...500 Hz) conforming to IEC 60068-2-6
Shock resistance	50 gn conforming to IEC 60068-2-27
Electrical shock protection class	Class II conforming to IEC 61140
IP degree of protection	IP66 conforming to IEC 60529
NEMA degree of protection	NEMA 1 NEMA 12 NEMA 13 NEMA 2 NEMA 3 NEMA 3R NEMA 4 NEMA 4X

Ordering and shipping details

Category	21429 - 9001 SK,SKY
Discount Schedule	CS1
GTIN	00785901500582
Nbr. of units in pkg.	1
Package weight(Lbs)	0.28000000000000003
Returnability	Y
Country of origin	MX

Offer Sustainability

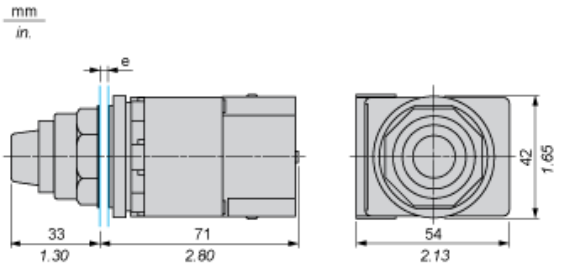
RoHS (date code: YYWW)	Compliant - since 0921 - Schneider Electric declaration of conformity Schneider Electric declaration of conformity
REACh	Reference not containing SVHC above the threshold Reference not containing SVHC above the threshold

Contractual warranty

Warranty period	18 months

Dimensions Drawings

Dimensions

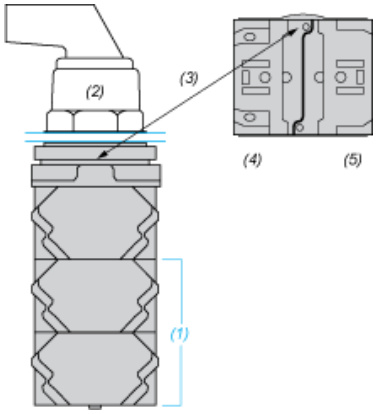


e panel thickness: 1 to 6 mm / 0.04 to 0.24 in.

Mounting and Clearance

Contact Block Mounting Position

Top and Rear views



(1) It is possible to mount up to 3 levels of contacts blocks (maximum of 6 contacts blocks)
(2) Operator
(3) Locating notch
(4) Side 1
(5) Side 2

Product data sheet
Characteristics

9001SKP38LWW9
WHITE LED PILOT LIGHT 120V 30MM T-SKP

Product availability : Stock - Normally stocked in distribution facility

Price* : 153.00 USD

Main

Range of product	Harmony 9001SK
Product or component type	Pilot light
Device short name	9001SK
Lens type	Domed plastic
Light block supply	Direct

Complementary

Bezel material	Plastic
Mounting diameter	1.18 in (30 mm)
Shape of signaling unit head	Round
Cap/Operator or lens colour	White
Light source	LED
Bulb base	BA 9s
[Us] rated supply voltage	120 V AC/DC
Tightening torque	7.08 lbf.in (0.8 N.m) conforming to EN/IEC 60947-1
Shape of screw head	Cross slotted head
Connections - terminals	Screw clamp terminals (1 x 0.22...2 x 1.5 mm²) conforming to EN/IEC 60947-1
[Ith] conventional free air thermal current	10 A
Short-circuit protection	10 A cartridge fuse conforming to EN/IEC 60947-5-1
[Ui] rated insulation voltage	250 V (degree of pollution: 2) conforming to EN/IEC 60947-1
[Uimp] rated impulse withstand voltage	2.5 kV conforming to EN/IEC 60947-1
Operating position	Any position
CAD overall width	2.13 in (54 mm)
CAD overall height	2.76 in (70 mm)
CAD overall depth	1.65 in (42 mm)
Product weight	0.18 lb(US) (0.082 kg)

Device presentation	Complete product
Compatibility code	9001SK

Environment

Electrical shock protection class	Class II conforming to IEC 61140
Protective treatment	TC
IP degree of protection	IP66 conforming to IEC 60529
NEMA degree of protection	NEMA 1 NEMA 12 NEMA 13 NEMA 2 NEMA 3 NEMA 3R NEMA 4 NEMA 4X
Vibration resistance	7 gn (f = 2...500 Hz) conforming to IEC 60068-2-6
Shock resistance	50 gn conforming to IEC 60068-2-27
Ambient air temperature for operation	-13...158 °F (-25...70 °C)
Ambient air temperature for storage	-40...158 °F (-40...70 °C)
Standards	EN/IEC 60947-1 EN/IEC 60947-5-1 EN/IEC 60947-5-4 JIS C 4520 JIS C 852 UL 508 CSA C22.2 No 14
Product certifications	NEMA UL 508

Ordering and shipping details

Category	21429 - 9001 SK,SKY
Discount Schedule	CS1
GTIN	00785901791058
Nbr. of units in pkg.	1
Package weight(Lbs)	0.17999999999999999
Returnability	Y
Country of origin	MX

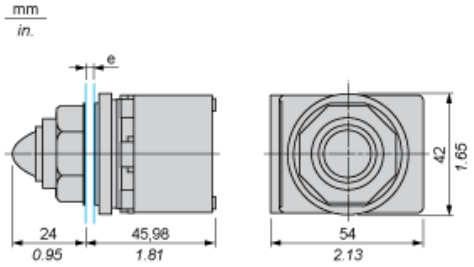
Offer Sustainability

RoHS (date code: YYWW)	Compliant - since 0921 - Schneider Electric declaration of conformity Schneider Electric declaration of conformity
REACh	Reference not containing SVHC above the threshold Reference not containing SVHC above the threshold

Contractual warranty

Warranty period	18 months

Dimensions Drawings



e panel thickness: 1 to 6 mm / 0.04 to 0.24 in.

Product data sheet
Characteristics

GV2P14
TeSys GV2 Manual Starter and Protector, thermal magnetic circuit protector, rotary handle, 6…10 A, screw clamp terminals

Product availability : Stock - Normally stocked in distribution facility

Price* : 233.00 USD

Main

Range	TeSys
Product name	TeSys GV2
Device short name	GV2P
Product or component type	Circuit breaker
Device application	Motor
Trip unit technology	Thermal-magnetic

Complementary

Poles description	3P
Network type	AC
Utilisation category	AC-3 conforming to IEC 60947-4-1 Category A conforming to IEC 60947-2
Network frequency	50/60 Hz conforming to IEC 60947-4-1
Fixing mode	Clipped on 35 mm symmetrical DIN rail Screwed on panel (with 2 x M4 screws)
Operating position	Any position
Motor power kW	3 kW at 400/415 V AC 50/60 Hz 5 kW at 500 V AC 50/60 Hz 5.5 kW at 690 V AC 50/60 Hz
Breaking capacity	50 kA Icu at 500 V AC 50/60 Hz conforming to IEC 60947-2 100 kA Icu at 230/240 V AC 50/60 Hz conforming to IEC 60947-2 100 kA Icu at 400/415 V AC 50/60 Hz conforming to IEC 60947-2 100 kA Icu at 440 V AC 50/60 Hz conforming to IEC 60947-2 6 kA Icu at 690 V AC 50/60 Hz conforming to IEC 60947-2
[Ics] rated service short-circuit breaking capacity	100 % at 230/240 V AC 50/60 Hz conforming to IEC 60947-2 100 % at 440 V AC 50/60 Hz conforming to IEC 60947-2 100 % at 500 V AC 50/60 Hz conforming to IEC 60947-2 100 % at 690 V AC 50/60 Hz conforming to IEC 60947-2

	100 % at 400/415 V AC 50/60 Hz conforming to IEC 60947-2
Control type	Rotary knob
[In] rated current	10 A
Thermal protection adjustment range	6...10 A
Magnetic tripping current	138 A
System Voltage	690 V AC 50/60 Hz conforming to IEC 60947-2
[Ui] rated insulation voltage	690 V AC 50/60 Hz conforming to IEC 60947-2
[Ith] conventional free air thermal current	10 A conforming to IEC 60947-4-1
[Uimp] rated impulse withstand voltage	6 kV conforming to IEC 60947-2
Power dissipation per pole	2.5 W
Mechanical durability	100000 cycles
Electrical durability	100000 cycles AC-3 at 440 V
Operating rate	25 cyc/h
Rated duty	Continuous conforming to IEC 60947-4-1
Connections - terminals	Screw clamp terminals 2 cable(s) 1...6 mm² solid Screw clamp terminals 2 cable(s) 1.5...6 mm² flexible without cable end Screw clamp terminals 2 cable(s) 1...4 mm² flexible with cable end
Tightening torque	1.7 N.m on screw clamp terminals
Suitability for isolation	Yes conforming to IEC 60947-1
Phase failure sensitivity	Yes conforming to IEC 60947-4-1
Height	3.5 in (89 mm)
Width	1.77 in (45 mm)
Depth	3.82 in (97 mm)

Environment

Standards	EN 60204 IEC 60947-1 IEC 60947-2 IEC 60947-4-1 NF C 63-120 NF C 63-650 NF C 79-130 UL 508 VDE 0113 VDE 0660 CSA C22.2
Product certifications	ATEX BV CCC CSA DNV EZU GL LROS (Lloyds register of shipping) RINA TSE UL UL 508 type E EAC
Protective treatment	TH
IP degree of protection	IP20 conforming to IEC 60529
IK degree of protection	IK04
Ambient air temperature for operation	-4...140 °F (-20...60 °C)
Ambient air temperature for storage	-40...176 °F (-40...80 °C)
Fire resistance	1760 °F (960 °C) conforming to IEC 60695-2-1
Operating altitude	6561.68 ft (2000 m)

Ordering and shipping details

Category	22367 - MANUAL STR PROTECTOR - GV2

Discount Schedule	I11
GTIN	00785901832577
Nbr. of units in pkg.	1
Package weight(Lbs)	0.76000000000000001
Returnability	Y
Country of origin	TH

Offer Sustainability

Sustainable offer status	Green Premium product
RoHS (date code: YYWW)	Compliant - since 0631 - Schneider Electric declaration of conformity Schneider Electric declaration of conformity
REACh	Reference contains SVHC above the threshold - Go to CaP for more details Go to CaP for more details
Product environmental profile	Available
Product end of life instructions	Need no specific recycling operations
California proposition 65	WARNING: This product can expose you to chemicals including:
- - - - - - - Substance 1	Antimony oxide & Antimony trioxide, which is known to the State of California to cause cancer.
- - - - - - - More information	For more information go to www.p65warnings.ca.gov

Contractual warranty

Warranty period	18 months

Product data sheet
Characteristics

LC1D12G7
TeSys D contactor - 3P(3 NO) - AC-3 - <= 440 V 12 A - 120 V AC coil

Product availability : Stock - Normally stocked in distribution facility

Offer Sustainability

Sustainable offer status	Green Premium product
RoHS (date code: YYWW)	Compliant - since 0627 - Schneider Electric declaration of conformity Schneider Electric declaration of conformity
REACh	Reference not containing SVHC above the threshold Reference not containing SVHC above the threshold
Product environmental profile	Available
Product end of life instructions	Available

Ordering and shipping details

Category	22345 - CTR,D-LINE,OPEN,NONREV-NEW
Discount Schedule	I12
GTIN	00785901207047
Nbr. of units in pkg.	1
Package weight(Lbs)	0.80000000000000004
Returnability	Y
Country of origin	ID

Contractual warranty

Warranty period	18 months

Main

Range	TeSys
Product name	TeSys D
Product or component type	Contactor
Device short name	LC1D

Contactor application	Motor control Resistive load
Utilisation category	AC-1 AC-3
Poles description	3P
Pole contact composition	3 NO
System Voltage	<= 690 V AC 25...400 Hz power circuit <= 300 V DC power circuit
[Ie] rated operational current	25 A (<= 140 °F (60 °C)) at <= 440 V AC AC-1 power circuit 12 A (<= 140 °F (60 °C)) at <= 440 V AC AC-3 power circuit
Motor power kW	3 kW at 220...230 V AC 50/60 Hz 5.5 kW at 380...400 V AC 50/60 Hz 5.5 kW at 415...440 V AC 50/60 Hz 7.5 kW at 500 V AC 50/60 Hz 7.5 kW at 660...690 V AC 50/60 Hz
Motor power hp	3 hp at 230/240 V AC 50/60 Hz 3 phases motors 7.5 hp at 460/480 V AC 50/60 Hz 3 phases motors 1 hp at 115 V AC 50/60 Hz 1 phase motors 3 hp at 200/208 V AC 50/60 Hz 3 phases motors 2 hp at 230/240 V AC 50/60 Hz 1 phase motors 10 hp at 575/600 V AC 50/60 Hz 3 phases motors
Control circuit type	AC 50/60 Hz
Control circuit voltage	120 V AC 50/60 Hz
Auxiliary contact composition	1 NO + 1 NC
[Uimp] rated impulse withstand voltage	6 kV conforming to IEC 60947
Overvoltage category	III
[Ith] conventional free air thermal current	25 A at <= 140 °F (60 °C) power circuit 10 A at <= 140 °F (60 °C) signalling circuit
Irms rated making capacity	140 A AC signalling circuit conforming to IEC 60947-5-1 250 A DC signalling circuit conforming to IEC 60947-5-1 250 A at 440 V power circuit conforming to IEC 60947
Rated breaking capacity	250 A at 440 V power circuit conforming to IEC 60947
[Icw] rated short-time withstand current	105 A <= 104 °F (40 °C) 10 s power circuit 210 A <= 104 °F (40 °C) 1 s power circuit 30 A <= 104 °F (40 °C) 10 min power circuit 61 A <= 104 °F (40 °C) 1 min power circuit 140 A 100 ms signalling circuit 100 A 1 s signalling circuit 120 A 500 ms signalling circuit
Associated fuse rating	40 A gG at <= 690 V coordination type 1 power circuit 10 A gG signalling circuit conforming to IEC 60947-5-1 25 A gG at <= 690 V coordination type 2 power circuit
Average impedance	2.5 mOhm at 50 Hz - Ith 25 A power circuit
[Ui] rated insulation voltage	690 V signalling circuit conforming to IEC 60947-1 690 V power circuit conforming to IEC 60947-4-1 600 V signalling circuit certifications CSA 600 V signalling circuit certifications UL 600 V power circuit certifications CSA 600 V power circuit certifications UL
Electrical durability	0.8 Mcycles 25 A AC-1 at Ue <= 440 V 2 Mcycles 12 A AC-3 at Ue <= 440 V
Power dissipation per pole	0.36 W AC-3 1.56 W AC-1
Protective cover	With
Mounting support	Plate Rail
Standards	CSA C22.2 No 14 EN 60947-5-1 IEC 60947-4-1 UL 508 EN 60947-4-1 IEC 60947-5-1
Product certifications	BV CCC CSA

	DNV GL GOST RINA UL LROS
Connections - terminals	Power circuit: screw clamp terminals 1 cable(s) 0...0.01 in² (1...4 mm²) - cable stiffness: flexible - without cable end Power circuit: screw clamp terminals 2 cable(s) 0...0 in² (1...2.5 mm²) - cable stiffness: flexible - with cable end Control circuit: screw clamp terminals 1 cable(s) 0...0.01 in² (1...4 mm²) - cable stiffness: flexible - without cable end Control circuit: screw clamp terminals 2 cable(s) 0...0.01 in² (1...4 mm²) - cable stiffness: flexible - without cable end Control circuit: screw clamp terminals 1 cable(s) 0...0.01 in² (1...4 mm²) - cable stiffness: flexible - with cable end Power circuit: screw clamp terminals 2 cable(s) 0...0.01 in² (1...4 mm²) - cable stiffness: solid - without cable end Control circuit: screw clamp terminals 2 cable(s) 0...0 in² (1...2.5 mm²) - cable stiffness: flexible - with cable end Control circuit: screw clamp terminals 1 cable(s) 0...0.01 in² (1...4 mm²) - cable stiffness: solid - without cable end Power circuit: screw clamp terminals 2 cable(s) 0...0.01 in² (1...4 mm²) - cable stiffness: flexible - without cable end Power circuit: screw clamp terminals 1 cable(s) 0...0.01 in² (1...4 mm²) - cable stiffness: flexible - with cable end Power circuit: screw clamp terminals 1 cable(s) 0...0.01 in² (1...4 mm²) - cable stiffness: solid - without cable end Control circuit: screw clamp terminals 2 cable(s) 0...0.01 in² (1...4 mm²) - cable stiffness: solid - without cable end
Tightening torque	Power circuit: 15.04 lbf.in (1.7 N.m) - on screw clamp terminals - with screwdriver Philips No 2 Control circuit: 15.04 lbf.in (1.7 N.m) - on screw clamp terminals - with screwdriver Philips No 2 Power circuit: 15.04 lbf.in (1.7 N.m) - on screw clamp terminals - with screwdriver flat Ø 6 mm Control circuit: 15.04 lbf.in (1.7 N.m) - on screw clamp terminals - with screwdriver flat Ø 6 mm
Operating time	4...19 ms opening 12...22 ms closing
Safety reliability level	B10d = 1369863 cycles contactor with nominal load conforming to EN/ISO 13849-1 B10d = 20000000 cycles contactor with mechanical load conforming to EN/ISO 13849-1
Mechanical durability	15 Mcycles
Operating rate	3600 cyc/h at <= 140 °F (60 °C)

Complementary

Coil technology	Without built-in suppressor module
Control circuit voltage limits	0.3...0.6 Uc drop-out at 140 °F (60 °C), AC 50/60 Hz 0.8...1.1 Uc operational at 140 °F (60 °C), AC 50 Hz 0.85...1.1 Uc operational at 140 °F (60 °C), AC 60 Hz
Inrush power in VA	70 VA at 68 °F (20 °C) (cos ϕ 0.75) 50 Hz 70 VA at 68 °F (20 °C) (cos ϕ 0.75) 60 Hz
Hold-in power consumption in VA	7.5 VA at 68 °F (20 °C) (cos ϕ 0.3) 60 Hz 7 VA at 68 °F (20 °C) (cos ϕ 0.3) 50 Hz
Heat dissipation	2...3 W at 50/60 Hz
Auxiliary contacts type	Type mirror contact (1 NC) conforming to IEC 60947-4-1 Type mechanically linked (1 NO + 1 NC) conforming to IEC 60947-5-1
Signalling circuit frequency	25...400 Hz
Minimum switching current	5 mA signalling circuit
Minimum switching voltage	17 V signalling circuit
Non-overlap time	1.5 ms on energisation (between NC and NO contact) 1.5 ms on de-energisation (between NC and NO contact)
Insulation resistance	> 10 MOhm signalling circuit

Environment

IP degree of protection	IP2x front face conforming to IEC 60529
Protective treatment	TH conforming to IEC 60068-2-30
Pollution degree	3

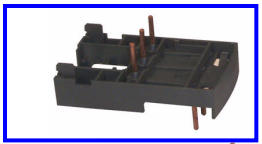
Ambient air temperature for operation	-4...140 °F (-20...60 °C)
Ambient air temperature for storage	-76...176 °F (-60...80 °C)
Permissible ambient air temperature around the device	-40...158 °F (-40...70 °C) at Uc
Operating altitude	9842.52 ft (3000 m) without derating in temperature
Fire resistance	1562 °F (850 °C) conforming to IEC 60695-2-1
Flame retardance	V1 conforming to UL 94
Mechanical robustness	Shocks contactor open 10 Gn for 11 ms Shocks contactor closed 15 Gn for 11 ms Vibrations contactor open 2 Gn, 5...300 Hz Vibrations contactor closed 4 Gn, 5...300 Hz
Height	3.03 in (77 mm)
Width	1.77 in (45 mm)
Depth	3.39 in (86 mm)
Product weight	0.72 lb(US) (0.325 kg)

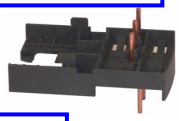
Table 56: GV2 Accessories

GV2GH7

LAD31

LAD311





GV2AF3 / GV2AF4

Busbars

Description	No. of GV Starters	No. of Side-Mounted Auxiliary Blocks on Each GV Starter	Busbar Pitch (mm)	Sold in Lots of	Catalog Number	Weight, lb (kg)
Sets of 3-pole, 63 A busbars	2	none	45	1	**GV2G245**	0.08 (0.036)
		1 GV2AN, AM, AD	54	1	**GV2G254**	0.084 (0.038)
		1 or 2 GV2AN, AM, AD; or 1 GV2AS, AU	72	1	**GV2G272**	0.09 (0.042)
	3	None	45	1	**GV2G345**	0.12 (0.058)
		1 GV2AN, AM, AD	54	1	**GV2G354**	0.13 (0.060)
	4	None	45	1	**GV2G445**	0.17 (0.077)
		1 GV2AN, AM, AD	54	1	**GV2G454**	0.19 (0.085)
		1 or 2 GV2AN, AM, AD; or 1 GV2AS, AU	72	1	**GV2G472**	0.21 (0.094)
	5	1 GV2AN, AM, AD	54	1	**GV2G554**	0.22 (0.100)

Additional GV2 Wiring Accessories

Description	Application	Sold in Lots of	Catalog Number	Weight, lb (kg)
Protective end cover	For unused busbar outlets	5	**GV1G10**	0.01 (0.005)
Terminal blocks for supply to one or more GV2G• busbar sets	Connects from the top	1	**GV1G09**	0.09 (0.040)
	Connects from the bottom. The connector can be fitted with a GV1L3 current limiter.	1	**GV2G05**	0.25 (0.115)
Cover for terminal block	For mounting in modular panels	10	**LA9E07**	0.01 (0.005)
Flexible 3-pole connector	For connecting a GV2 / LS1D30 to an LC1D09–D25 AC contactor	10	**GV1G02**	0.03 (0.013)
Clip-in marker holders (provided with each motor starter)	For GV2P, 0.31 x 0.87 in. (8 x 22 mm)	100	**LA9D92**	0.02 (0.001)
Incoming line insulator	For GV2P when used in UL 508 Type E applications	10	**GV2GH7**	0.09 (0.040)

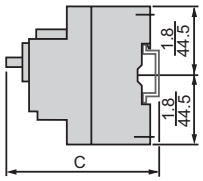
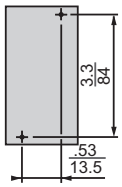
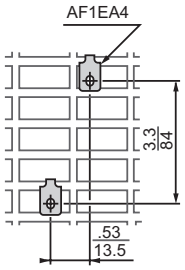
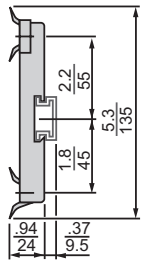
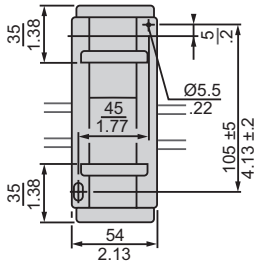
GV2 Mounting Accessories

Description	Application	Sold in Lots of	Catalog Number	Weight, lb (kg)
Motor starter adapter plate	With a 3-pole connector for mounting a GV2 controller to an LC1D09–D25 contactor	10	**GK2AF01**	0.26 (0.120)
Adapter plate	For screw mounting a GV2ME controller or an LS1D30 fuse holder	10	**GV2AF02**	0.05 (0.021)
	For mounting a GV2ME or GV2P controller to an LC1D09–LC1D32 contactor with front faces aligned	1	**LAD31**	0.09 (0.040)
Mounting bracket	For mounting a GV2ME or GV2P controller to an LC1D09–D38 contactor on a common base using 2 DIN rails	1	**LAD311**	0.09 (0.040)
7.5 mm height compensation plate	For mounting a GV2ME or GV2P controller on a common busbar	10	**GV1F03**	0.007 (0.003)
	Between a GV2ME controller or an LS1D30 fuse holder and a LC1K or LP1K contactor	10	**GV2AF01**	0.04 (0.021)
Combination block	Between a GV2 controller or an LS1D30 fuse holder and a LC1D09–D38 contactor	10	**GV2AF3**	0.03 (0.016)
	Between a GV2 controller or an LS1D30 fuse holder mounted on an LAD31 mounting plate and an LC1D09–D38 contactor	10	**GV2AF4**	0.03 (0.016)

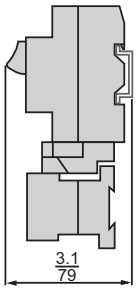
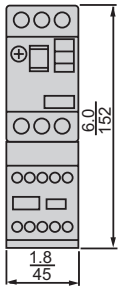
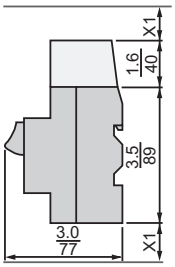
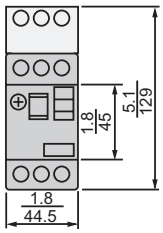
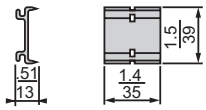
GV2 Padlocking Options

Description		Catalog Number	Weight, lb (kg)
Padlockable External Operator For GV2P controllers 6.0–11.4 in. (150–290 mm)	Black handle, blue legend plate IP54	**GV2AP01**	0.44 (0.200)
	Red handle, yellow legend plate IP54	**GV2AP02**	
Padlocking Device For all GV2 controllers	Accommodates up to 6 padlocks (not supplied) Maximum shank Ø 6 mm	**GV2V03**	0.20 (0.092)

Mounting of GV2P

On 35 mm (1.4 in.) Rail	On Panel	On Pre-Slotted Mounting Plate, AM1PA	On Adapter Plate, GK2AF01	
				

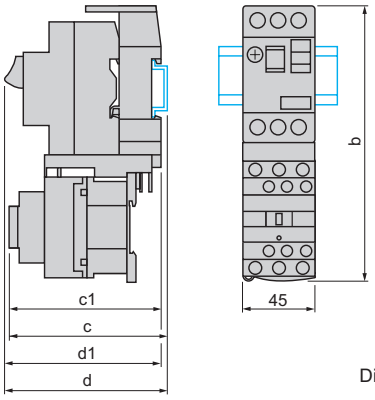
C = 3.09 in. (78.5 mm) on AM1DP200 (35 x 7.5 mm)
C = 3.39 in. (86 mm) on AM1DE200, ED200 (35 x 15 mm)

GV2AF01		GV2M and GV1L3		GV1F03
GV2M + K contactor combination		current limiter		7.5 mm height compensation plate
				2 REQUIRED  Dimensions: in. / mm

X1 = 0.40 in. (10 mm) for Ue = 230 V or 1.2 in. (30 mm) for 230 V < Ue ≤ 690 V

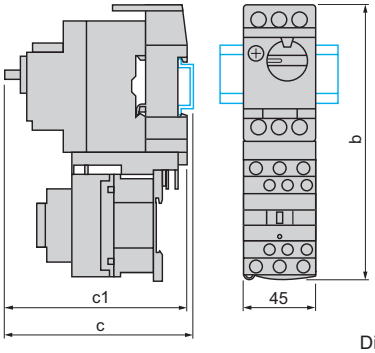
GV2AF4 and LAD31

Combination **GV2ME** and D range contactor



Dimensions: in. / mm

Combination **GV2P** and D range contactor



Dimensions: in. / mm

GV2ME +	LC2D09 to D18	LC2D25 and D32	GV2P +	LC2D09 to D18	LC2D25 and D32
b	7.4 (188.6)	7.8 (199)	b	6.61 (169.1)	7.9 (199.5)
c1	3.6 (92.7)	3.9 (99)	c1	4.6 (116.8)	4.6 (116.8)
c	3.9 (98.2)	4.11 (104.5)	c	4.8 (122.3)	4.8 (122.3)
d1	3.9 (98.3)	3.9 (98.3)			
d	4.1 (103.8)	1.4 (103.8)			

Product data sheet
Characteristics

9001SKS43FBH2
SELECTOR SWITCH 600VAC 10A 30MM SK

Product availability : Stock - Normally stocked in distribution facility

Price* : 152.00 USD

Main

Range of product	Harmony 9001SK
Product or component type	Selector switch
Device short name	9001SK

Complementary

Bezel material	Plastic
Mounting diameter	1.18 in (30 mm)
Device presentation	Complete product
Compatibility code	9001SK

Environment

Protective treatment	TC
Ambient air temperature for storage	-40...158 °F (-40...70 °C)
Ambient air temperature for operation	-13...158 °F (-25...70 °C)
Electrical shock protection class	Class II conforming to IEC 61140
IP degree of protection	IP66 conforming to IEC 60529
NEMA degree of protection	NEMA 1/2/3/3R/4/4X/6/12/13
Product certifications	CE CSA LR24590 class 3211 03 UL listed file E42259 CCN NKCR

Ordering and shipping details

Category	21429 - 9001 SK,SKY
Discount Schedule	CS1
GTIN	00785901043829
Nbr. of units in pkg.	1
Package weight(Lbs)	0.25

Returnability	Y
Country of origin	MX

Contractual warranty

Warranty period	18 months

Product data sheet
Characteristics

9070TF250D1
TRANSFORMER CONTROL 250VA 240/480V-120V

Product availability : Stock - Normally stocked in distribution facility

Price* : 287.00 USD

Main

Product or component type	Industrial Control Transformer
Rated power in VA	250 VA
Primary voltage	240 x 480 V 220 x 440 V 230 x 460 V
Secondary voltage	120 V 110 V 115 V
Range of product	TF

Complementary

Phase	1 phase
Rated power in VA	250 VA per UL 250 VA per CSA 250 VA per NOM 160 VA per CE
Primary voltage	220 x 440 V : 110 V 230 x 460 V : 115 V 240 x 480 V : 120 V
Fuse type	CC 0.41 x 1.50 in top
Temperature rise	80 °C
Electrical connection	Screw clamp terminals
Height	4.5 in
Width	3.75 in
Depth	5.3 in
Material	Copper winding
Product compatibility	FSC2

Environment

Product certifications	CSA file LR37055 guide 184-N-90 UL listed file E61239 CE
NEMA degree of protection	Not rated (open device)
Insulation temperature	266 °F (130 °C)

Ordering and shipping details

Category	16203 - 9070 TF (NOT T) 250-1000VA
Discount Schedule	CP8
GTIN	00785901904861
Nbr. of units in pkg.	1
Package weight(Lbs)	8.3599999999999994
Returnability	Y
Country of origin	MX

Offer Sustainability

Sustainable offer status	Green Premium product
RoHS (date code: YYWW)	Compliant - since 1227 - Schneider Electric declaration of conformity Schneider Electric declaration of conformity
REACh	Reference not containing SVHC above the threshold Reference not containing SVHC above the threshold
Product environmental profile	Available
Product end of life instructions	Need no specific recycling operations

Contractual warranty

Warranty period	18 months

DINnectors® Accessories

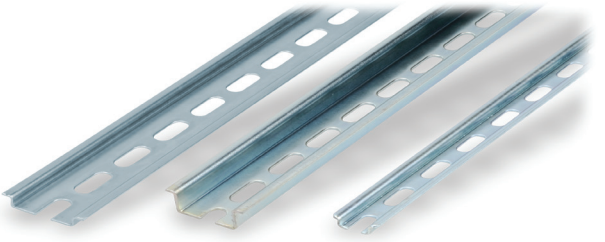
Steel DIN Rails Features

35mm wide

- Available in 1-meter lengths
- 7.5 mm-high rails primarily used to mount terminal blocks, relays, timers and small PLCs such as the DL05, DL06, DL105, DL205, CLICK, and Productivity3000
- 15mm-high rails for mounting larger and heavier components such as contactors and larger PLCs

15mm wide

- Available in 1-meter lengths
- DN-R15S1 exclusively for mounting mini terminal blocks such as the DN-M10-A



	Part Number	Pcs/ Pkg	Price/ Pkg	Part#	Pcs/ Pkg	Price/ Pkg	Part Number	Pcs/ Pkg	Price/ Pkg
DIN Rail	DN-R35S1	10	$28.00	DN-R35HS1	10	$49.50	DN-R15S1	10	$26.00
	DN-R35S1-2	2	$9.00	DN-R35HS1-2	2	$12.00	DN-R15S1-2	2	$8.00
Steel DINnectors Accessories Specifications									
Description	Steel, slotted, 3'3" [1m] length, 35mm [1.38 in] wide, 7.5 mm [0.30 in] high			Steel, slotted, 3'3" [1m] length, 35mm [1.38 in] wide, 15mm [0.59 in] high			Steel, slotted, 3'3" [1m] length, 15mm [0.59 in] wide, 5.5 mm [0.22 in] high		
Plating	Zinc-plated and chromated								
International Standards	EN60715. RoHS								
Suggested Mounting Screw Type	M6			M6			M4		

Aluminum DIN Rail Features

35mm wide

- Non-anodized finish
- Zinc plating and passivation (minimum thickness 6 microns)
- Lightweight, easy to cut and deburr
- Terminal blocks only
- Maximum mounting screw #10-32 or M5
- Available in 1-meter lengths

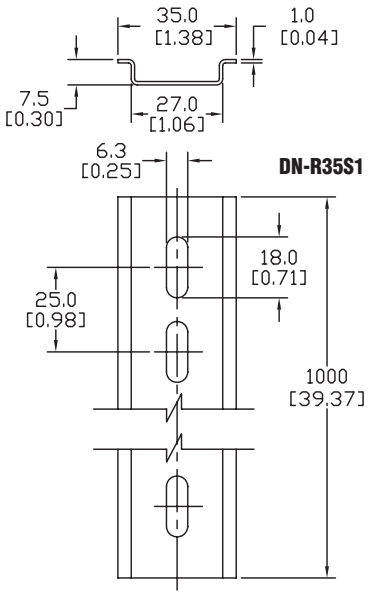
35mm wide raised

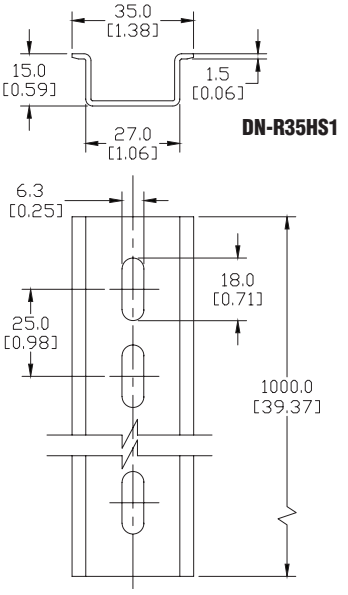
- Non-anodized finish
- Zinc plating and passivation (minimum thickness 6 microns)
- Enables users to raise terminal blocks 2¼" above the back panel
- Terminal blocks only
- Available in 1-meter lengths
- Bushing or grommet recommended for wire access hole (example Heyco UB-875 not sold by ADC)

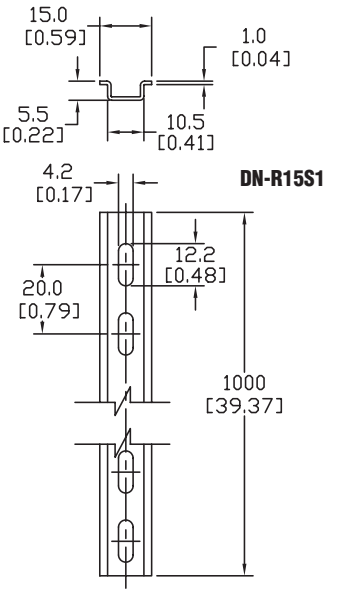
	Part Number	Pcs/ Pkg	Price /Pkg	Part Number	Pcs/ Pkg	Price/ Pkg
DIN Rail	DN-R35SAL1	10	$36.00	DN-R35SAL2-2	2	$24.25
	DN-R35SAL1-2	2	$8.00			
Aluminum DIN Rail Specifications						
Description	Aluminum, slotted, 3'3" [1m] length, 35mm [1.38 in] wide, 10mm [0.39 in] high			Aluminum, slotted, 3'3" [1m] length, 35mm [1.38 in] wide, 58mm [2.28 in] high		
Plating	Galvanic zinc plating, non-anodized finish					
International Standards	DIN 50960, RoHS					
Suggested Mounting Screw Type	#10-32 or M5					

DINnectors® Accessories

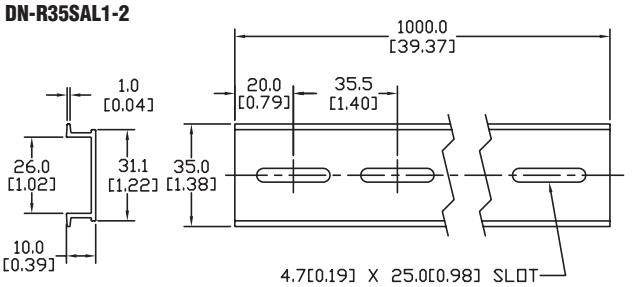
Dimensions mm [inches]



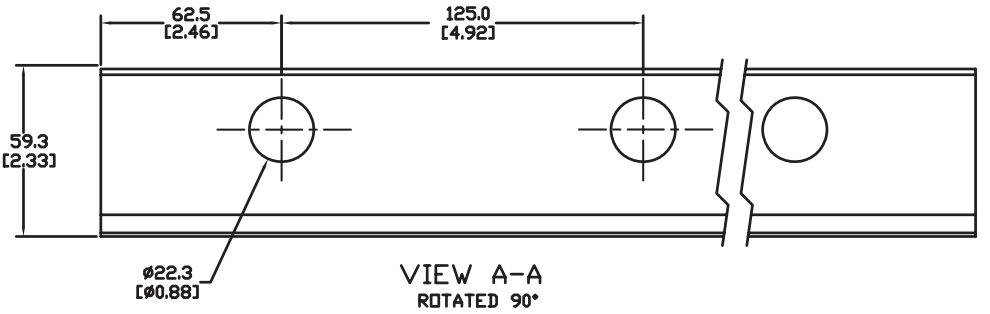


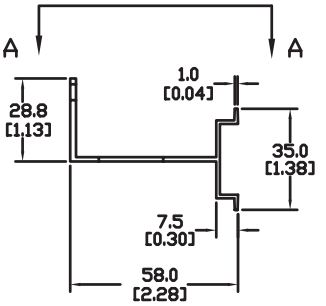


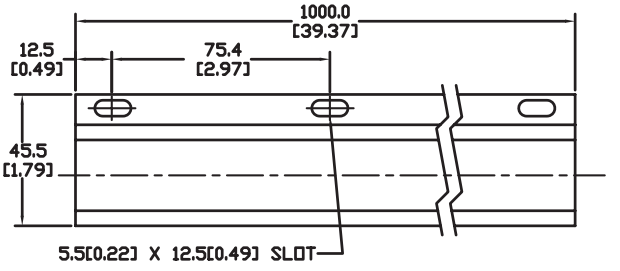
DN-R35SAL1
DN-R35SAL1-2



DN-R35SAL2-2







DINnectors® Accessories

DIN rail support brackets

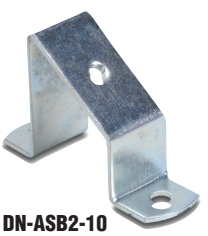
- Angled support brackets raise and tilt mounting rails 30 degrees from mounting surface for easier wiring
- DN-ASB1 plated steel support bracket
- DN-ASB2-10 cold-rolled steel treated with galvanic zinc plating and passivation

DIN rail mounting clips

- Snap small devices not made for mounting onto 35mm DIN rails
- Zinc plated steel

DIN Rail Support Brackets and Mounting Clips			
Part Number	***Description***	***Pcs/Pkg***	***Price Each***
DN-ASB1	30˚angled DIN rail support bracket (M6-1.0 screws not included)	50	$49.50
DN-ASB2-10	30˚angled DIN rail support bracket (M6-1.0 screws included)	10	$12.00
DN-SSB25-10	1" [25mm] DIN rail support bracket (M6-1.0 screws included)	10	$17.00
DN-SSB50-10	2" [50mm] DIN rail support bracket (M6-1.0 screws included)	10	$18.25
DN-SSB70-10	2.75" [70mm] DIN rail support bracket (M6-1.0 screws included)	10	$23.00
DN-SSB90-10	3.5" [90mm] DIN rail support bracket (M6-1.0 screws included)	10	$24.25
DN-CLIP-FM4	DIN rail mounting clip with M4 x 0.7 mm threaded hole (Screws not included)	40	$45.00
DN-CLIP-FM4-5		5	$6.25
DN-CLIP-FM5	DIN rail mounting clip with M5 x 0.8 mm threaded hole (Screws not included)	40	$49.50
DN-CLIP-FM5-5		5	$7.00


DN-ASB1


DN-ASB2-10


DN-SSB25-10


DN-SSB50-10


DN-SSB70-10


DN-SSB90-10

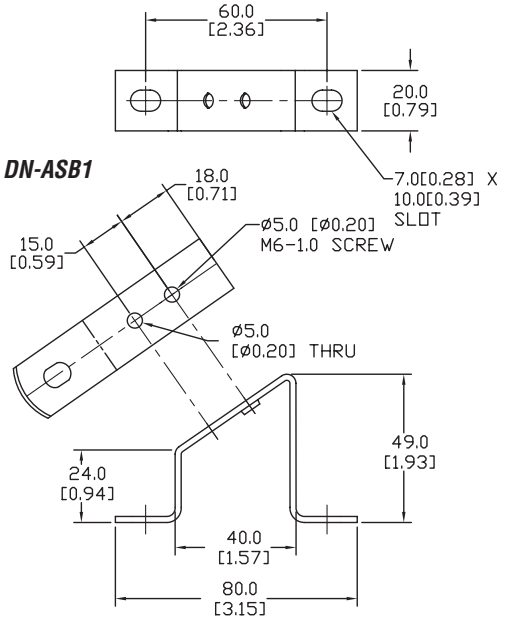

DN-CLIP-FM4
DN-CLIP-FM4-5

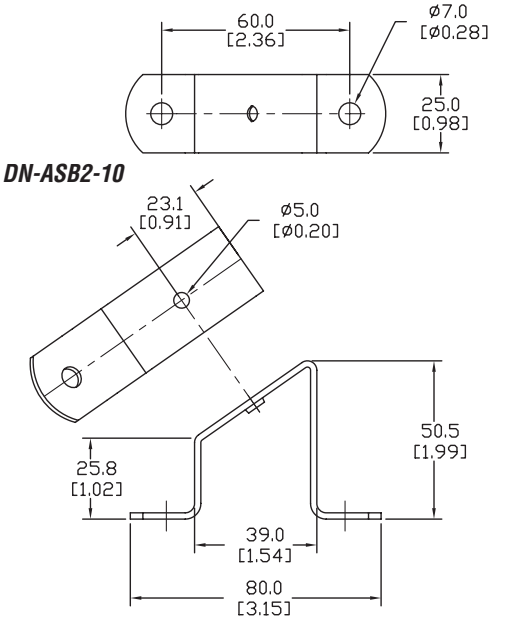

DN-CLIP-FM5
DN-CLIP-FM5-5

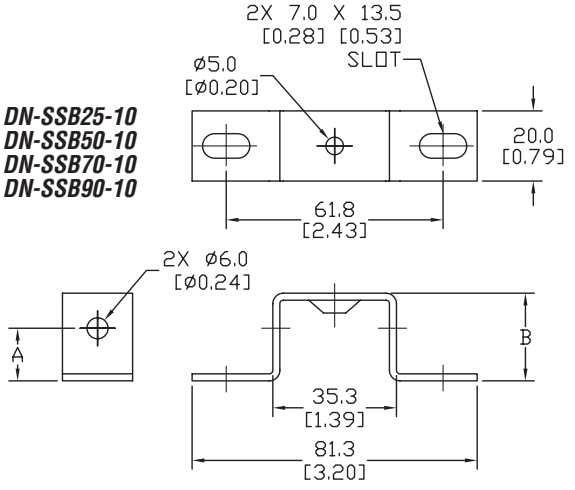
DINnectors® Accessories

DIN Rail Support Brackets and Mounting Clips

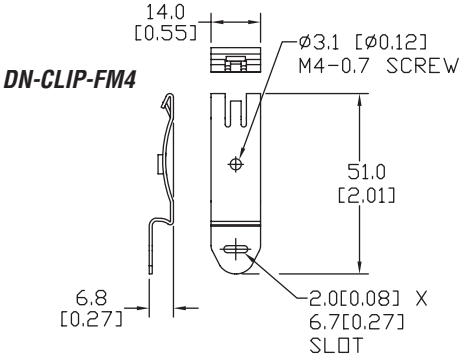
Dimensions mm [inches]

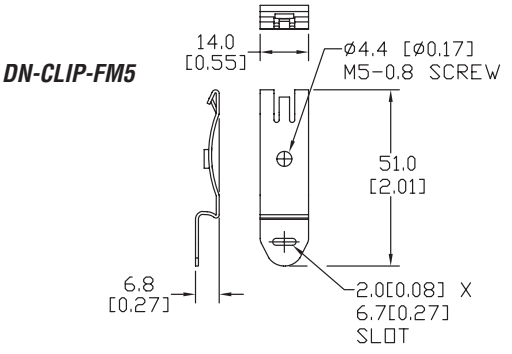






DIN Rail Support Brackets		
Part Number	*DIM A mm [inches]*	*DIM B mm [inches]*
DN-SSB25-10	15.0 [0.59]	25.0 [0.98]
DN-SSB50-10	40.0 [1.58]	50.0 [1.97]
DN-SSB70-10	60.0 [2.36]	70.0 [2.76]
DN-SSB90-10	80.0 [3.15]	90.0 [3.54]



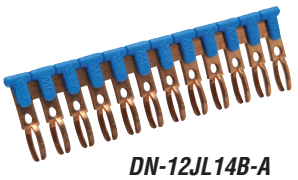


DINnectors® Accessories

Jumpers

Multi-pole jumper bars for DINnector terminal blocks

Multi-pole Jumper Bars									
Part Number	Pcs/ Pkg	Price	Part Number	Pcs/ Pkg	Price	# of Poles	UL Rating (V)	UL Rating (A)	Insulation Color	For Use With Terminal Block Series
DN-2J2YMN	25	$7.50	DN-2J2Y	100	$26.00	2	600	25	Orange	DN-T12-A, DN-EMX, DN-Q12-A, DN-QD12-A, DN-QEMX, DN-QKBD12-A
DN-2J4YMN	25	$8.00	DN-2J4Y	100	$27.50	2	600	25	Yellow	DN-T10-A, DN-D10-A, DN-M10-A, DN-Q10-A
DN-2J6YMN	25	$9.00	DN-2J6Y	100	$34.50	2	600	30	Green	DN-Q8-A
–	–	–	DN-2J6	100	$45.00	2	600	65	–	DN-T6
DN-2JL14-AMN	25	$9.00	DN-2JL14-A	100	$39.00	2	300	20	Red	DN-TL-A
DN-2JL14B-AMN	25	$9.00	DN-2JL14B-A	100	$39.00	2	300	20	Blue	DN-TL-A
DN-3J2YMN	25	$10.25	DN-3J2Y	100	$36.50	3	600	25	Orange	DN-T12-A, DN-EMX, DN-Q12-A, DN-QD12-A, DN-QEMX, DN-QKBD12-A
DN-3J4YMN	25	$12.00	DN-3J4Y	100	$43.50	3	600	25	Yellow	DN-T10-A, DN-D10-A, DN-M10-A, DN-Q10-A
DN-3J6YMN	25	$13.00	DN-3J6Y	100	$50.00	3	600	30	Green	DN-Q8-A
–	–	–	DN-3J6	100	$78.00	3	600	65	–	DN-T6
DN-3JL14-AMN	25	$12.50	DN-3JL14-A	100	$59.00	3	300	20	Red	DN-TL-A
DN-3JL14B-AMN	25	$12.50	DN-3JL14B-A	100	$59.00	3	300	20	Blue	DN-TL-A
			DN-4J6	100	$100.00	4	600	65	–	DN-T6
			DN-12J6Y	10	$21.00	12	600	30	Green	DN-Q8-A
			DN-12JL14-A	10	$15.00	12	300	20	Red	DN-TL-A
			DN-12JL14B-A	10	$15.00	12	300	20	Blue	DN-TL-A
			DN-12JFE	10	$35.00	12	300	25	Blue	DN-FE4
			DN-24J2Y	5	$16.00	24	600	25	Yellow	DN-T12-A, DN-EMX, DN-Q12-A, DN-QD12-A, DN-QEMX, DN-QKBD12-A
			DN-24J4Y	5	$17.00	24	600	25	Yellow	DN-T10-A, DN-D10-A, DN-M10-A, DN-Q10-A
			DN-24J8	5	$24.00	24	600	50	Green	DN-T8
			DN-55J6	1	$15.00	55	600	65	–	DN-T6

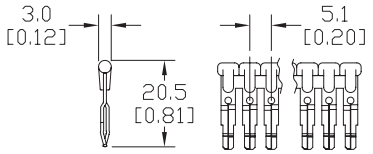


DN-12JL14B-A shown

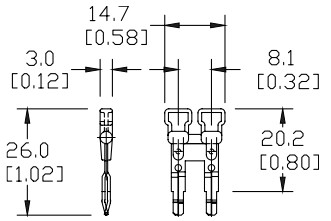
Dimensions

mm [inches]

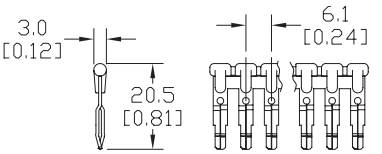
DN-xJ2Y / DN-xJ2YMN



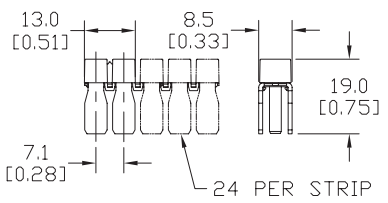
DN-xJ6Y / DN-xJ6YMN



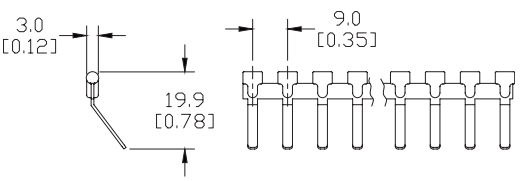
DN-xJ4Y / DN-xJ4YMN



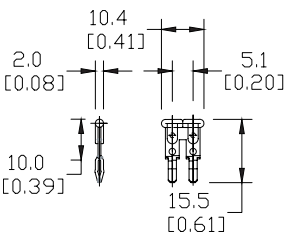
DN-24J8



DN-12JFE



DN-xJL14 / DN-xJL14x-AMN
DN-xJ14x-A



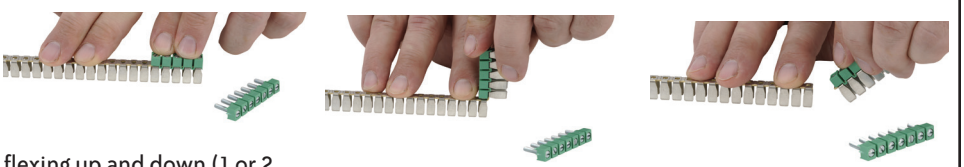
DINnectors® Accessories

Modifying a DN-24J8 jumper bar to the required number of poles

1) Place the insulating part into the jumper bar and insert screws, based on number of poles required. (For instance, in the following example, 5 poles are required). Click into place.

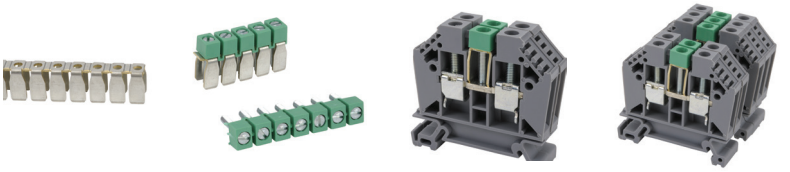
2) Using a cutting tool, cut the insulating part at the edge of the jumper bar (see below).

3) Hold the metal jumper bar and insulating jumper with two hands, placing fingers to the left and right of the pole you wish to cut, repeatedly flexing up and down (1 or 2 times should be sufficient) until the jumper bar and insulating jumper break in two.



4) Remove the small remaining piece of jumper (see below). This is important to ensure appropriate insulation distance in the case of contiguously applied jumpers in sequence. This step also facilitates the placement of a separator terminal if the bridge is positioned as the last terminal of a group.

5) The jumpers now are ready to be screwed onto DN-T8 series terminal blocks.



Jumper Cutting Tools

Jumper cutting tools maintain protective covering.

Jumper Cutting Tools			
Part Number	**Description**	**Pcs/Pkg**	**Price**
DN-J2CUT	Cutting tool for DN-2J2Y, DN-3J2Y and DN-24J2Y jumpers.	1	$46.50
DN-J4CUT	Cutting tool for DN-2J4Y, DN-3J4Y and DN-24J4Y jumpers.	1	$46.50
DN-J6CUT	Cutting tool for DN-12J6Y jumpers.	1	$65.00
DN-JL14CUT	Cutting tool for DN-12JL14-A and DN-12JL14B-A jumpers.	1	$65.00
DN-JXCUT	Cutting tool without dies for DN-J12DIE, DN-J4DIE, DN-J6DIE, DN-JL14DIE AND DN-JFEDIE dies. Order dies separately.	1	$45.00
DN-JFECUT	Cutting tool for DN-12JFE	1	$55.00
DN-JKIT	Cutting tool kit for DN series jumpers. Includes (1) DN-JXCUT cutting tool, (5) dies (DN-J2DIE, DN-J4DIE, DN-J6DIE, DN-JL14DIE, and DN-JFEDIE).	1	$219.00
DN-TOOL2	Tool kit for DN series terminal blocks. Includes (1) spring opening tool for DN-Q series screwless terminal blocks and (1) jumper removal tool for J2, J4, J6, and JL14 jumpers.	1	$6.25

Replacement Dies			
Part Number	**Description**	**Pcs/Pkg**	**Price**
DN-J2DIE	Replacement dies for DN-J2CUT.	2	$65.00
DN-J4DIE	Replacement dies for DN-J4CUT.	2	$65.00
DN-JFEDIE	Replacement dies for DN-JFECUT.	2	$55.00
DN-J6DIE	Replacement dies for DN-J6CUT.	2	$69.00
DN-JL14DIE	Replacement dies for DN-JL14CUT.	2	$69.00
Note: Replacement Dies also work with DN-JxCUT.			

DN-J2CUT

DN-J4CUT

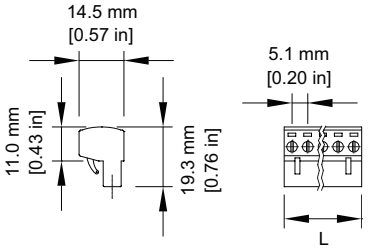
DN-JKIT

DN-TOOL2

DINnectors® Accessories

Terminal Plugs

DN-xxPLUG / DN-xxPLUGMN



Accessories – Terminal Plugs							
Plugs* Part Number	Pcs/ Pkg	Price/ Pkg	Plugs* Part Number	Pcs/Pkg	Price/ Pkg	Number of Poles	Length mm [in]
DN-2PLUG	200	$67.00	DN-2PLUGMN	10	$4.25	2	10.2 [0.40]
DN-3PLUG	200	$104.00	DN-3PLUGMN	10	$6.25	3	15.2 [0.60]
DN-4PLUG	100	$69.00	DN-4PLUGMN	10	$8.25	4	20.3 [0.80]
DN-5PLUG	100	$70.00	DN-5PLUGMN	10	$10.25	5	25.4 [1.00]
DN-6PLUG	100	$81.00	DN-6PLUGMN	10	$10.25	6	30.5 [1.20]
DN-7PLUG	50	$49.50	DN-7PLUGMN	5	$8.25	7	35.6 [1.40]
DN-8PLUG	50	$68.00	DN-8PLUGMN	5	$8.25	8	40.6 [1.60]
DN-9PLUG	50	$63.25	DN-9PLUGMN	5	$9.00	9	45.7 [1.80]
DN-10PLUG	50	$80.00	DN-10PLUGMN	5	$10.00	10	50.8 [2.00]
DN-11PLUG	50	$77.00	DN-11PLUGMN	5	$11.00	11	55.9 [2.20]
DN-12PLUG	50	$103.00	DN-12PLUGMN	5	$11.75	12	61.0 [2.40]

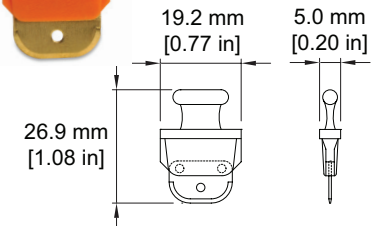
Terminal Plugs Ratings	
Voltage/Current	300V, 12A
Wire Gauge	14–22 AWG, CU only
Torque	Tightening Torque: 0.51 N·m [4.5 lb·in]
Usage Temperature	Ambient air temperature: -20°C to 105°C [-4°F to 221°F] Relative humidity: 50% max at 40°C [104°F]; 90% max at 20°C [68°F]
Agency Approvals	UL file #: E179129

Note: To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.

** DN-xxPLUGs fit all DN-EMXxx & DN-QEMXxx plug-in terminal blocks*

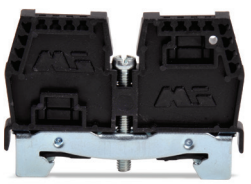
Disconnect Blade

DN-DIS-BLADE
DN-DIS-BMN



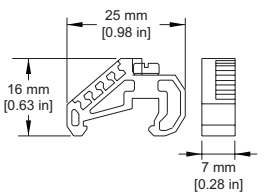
Disconnect Blade			
Part Number	Description	Pcs/Pkg	Price
DN-DIS-BLADE	Terminal block disconnect blade for DN-FE2, DN-FE4, DN-DIS2 and DN-DIS4	50	$21.50
DN-DIS-BMN		10	$5.50

End Brackets

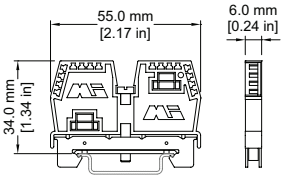


End Brackets			
Part Number	Description	Pcs/ Pkg	Price/ Pkg
DN-EB15	Terminal block end stop 7mm width screw clamping. Gray	100	$64.00
DN-EB15MN		20	$14.00
DN-EB35	Terminal block end stop 9mm width screw clamping. Gray	50	$39.50
DN-EB35MN		20	$18.00
DN-EB35-A	Terminal block end stop 6mm width screw clamping. Black	50	$28.50
DN-EB35-A-10		10	$7.50
DN-QEB35	Terminal block end stop 6mm width screwless clamping. Black	50	$25.50
DN-QEB35-10		10	$7.50

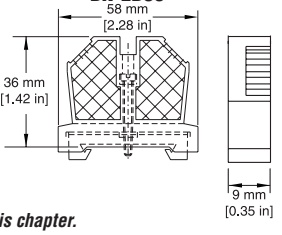
DN-EB15



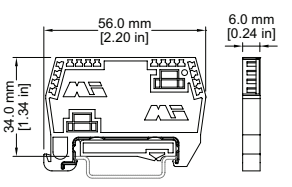
DN-EB35-A



DN-EB35



DN-QEB35



For more information on accessories, see the "DINnectors Accessories" section of this chapter.

DINnectors® Accessories

End Covers

Certain end covers can be used with multiple terminal block parts to cover and insulate the open side, or to put more space between adjacent blocks.

DINnectors End Covers				
Part Number	**Description**	**For Use With**	**Pcs/Pkg**	**Price**
DN-EC1210	Covers open side of DN-T12-A and DN-T10-A series terminal blocks	DN-T10-A, DN-T12-A	100	$26.00
DN-EC1210MN			25	$8.00
DN-EC86	Covers open side of DN-T8 and DN-T6 series terminal blocks	DN-T8, DN-T6	100	$28.00
DN-EC86MN			25	$8.00
DN-EC4	Covers open side of DN-T4 series terminal blocks	DN-T4	50	$17.00
DN-EC4MN			10	$3.50
DN-EC1/0	Covers open side of DN-T1/0 series terminal blocks	DN-T1/0	50	$19.50
DN-EC1/0MN			10	$4.00
DN-DEC10	Covers open side of DN-D10 series double-level terminal blocks	DN-D10	100	$18.00
DN-DEC10MN			10	$3.75
DN-EC14	Covers open side of DN-TL14-A series terminal blocks	DN-TL14-A	25	$10.00
DN-EC14S	Covers open side of DN-TL14S-A series terminal blocks	DN-TL14S-A	25	$9.00
DN-ECM10	Covers open side of DN-M10-A series terminal blocks	DN-M10-A DN-M10B-A	100	$26.00
DN-ECM10MN			25	$8.00
DN-ECKBD	Covers open side of DN-KBD12 (MN) series disconnect blocks	DN-KBD12 (MN)	100	$26.00
DN-ECKBDMN			10	$3.75
DN-EMXM1EC1	Covers open side of DN-EMXM1 and DN-QEMXM1 terminal blocks	DN-EMXM1 DN-QEMXM1	25	$8.50
DN-EMXM1EC2	Covers closed side of DN-EMXM1 and DN-QEMXM1 terminal blocks		25	$8.50
DN-EMXDVEC1	Covers open side of DN-EMXDV and DN-QEMXDV terminal blocks	DN-EMXDV DN-QEMXDV	25	$8.50
DN-EMXDVEC2	Covers closed side of DN-EMXDV and DN-QEMXDV terminal blocks		25	$8.50
DN-FESEP	Covers closed side of DN-FE sockets and DN-DIS disconnects	DN-FE, DN-DIS	50	$15.00
DN-FESEP-10			10	$3.00
DN-QEC12	Covers open side of DN-Q12-A or DN-QG12 series screwless terminal blocks	DN-Q12-A DN-QG12	50	$12.00
DN-QEC12MN			10	$3.25
DN-QEC10	Covers open side of DN-Q10-A or DN-QG10 series screwless terminal blocks	DN-Q10-A DN-QG10	50	$12.00
DN-QEC10MN			10	$3.25
DN-QEC8	Covers open side of DN-Q8-A or DN-QG8 series screwless terminal blocks	DN-Q8-A DN-QG8	50	$14.00
DN-QEC8MN			10	$3.50
DN-QEC12-1-2	Covers open side of DN-Q12-1-2-A and DN-QKBD12-A series screwless terminal blocks	DN-Q12-1-2-A, DN-QKBD12	25	$8.75
DN-QEC12-2-2	Covers open side of DN-Q12-2-2-A series screwless terminal blocks	DN-Q12-2-2-A	25	$9.75
DN-QDEC12	Covers open side of DN-QD12-A series screwless terminal blocks	DN-QD12-A	25	$9.75

Spacers

Spacers are used to put more space between adjacent blocks.

DINnectors Spacers				
Part Number	**Description**	**For Use with**	**Pcs/Pkg**	**Price**
DN-S1210	Spacer for DN-T12-A and DN-T10-A series terminal blocks	DN-T10-A DN-T12-A	100	$30.50
DN-S1210MN			25	$9.25
DN-S86	Spacer for DN-T8 and DN-T6 series terminal blocks	DN-T8 DN-T6	100	$36.50
DN-S86MN			25	$7.75
DN-EMXM1SPA1	Spacer for single-level plug-in terminal blocks	DN-EMXM1 DN-QEMXM1	25	$7.25
DN-EMXDVSPA1	Spacer for double-level plug-in terminal blocks	DN-EMXDV DN-QEMXDV	25	$8.25
DN-FESPA	Spacer for DN-FE sockets and DN-DIS disconnects	DN-FE DN-DIS	50	$15.00
DN-FESPA-10			10	$3.00

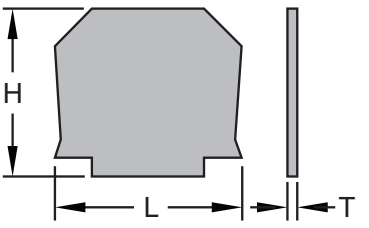
Top Covers

DINnectors Top Covers				
Part Number	**Description**	**For Use with**	**Pcs/Pkg**	**Price**
DN-C12	Top cover, clear, printed electrical symbol.	DN-T12-A	100	$36.50
DN-C12MN			25	$7.75
DN-C10	Top cover, clear, printed electrical symbol.	DN-T10-A	100	$36.50
DN-C10MN			25	$7.75
DN-C86	Top cover, clear, printed electrical symbol.	DN-T8 DN-T6	100	$36.50
DN-C86MN			25	$7.75
DN-DC10	Top cover, clear, printed electrical symbol.	DN-D10	100	$34.50
DN-DC10MN			25	$7.75
DN-MC10	Top cover, clear, printed electrical symbol.	DN-M10	100	$37.50
DN-MC10MN			25	$7.75

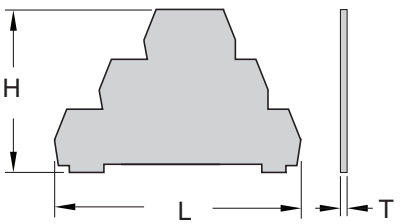
DINnectors® Accessories

DIN*nector* End Covers and Spacers Dimensions				
Part Number		*Length*	*Height*	*Thickness*
DN-EC1210	*DN-EC1210MN*	44mm [1.73 in]	35mm [1.38 in]	1.5 mm [0.06 in]
DN-S1210	*DN-S1210MN*	55mm [2.17 in]	44mm [1.73 in]	
DN-EC86	*DN-EC86MN*	50mm [1.97 in]	43mm [1.69 in]	
DN-S86	*DN-S86MN*	55mm [2.17 in]	49mm [1.93 in]	
DN-EC4	*DN-EC4MN*	56mm [2.21 in]	48mm [1.89 in]	
DN-EC1/0	*DN-EC1/0MN*	62mm [2.44 in]	60mm [2.36 in]	
DN-DEC10	*DN-DEC10MN*	72mm [2.80 in]	55mm [2.17 in]	
DN-EC14	–	78mm [3.08 in]	55mm [2.17 in]	
DN-EC14S	–	55mm [2.17 in]	50mm [1.97 in]	
DN-ECM10	*DN-ECM10MN*	32mm [1.26 in]	27mm [1.06 in]	
DN-ECKBD	*DN-ECKBDMN*	52mm [2.05 in]	34.5 mm [1.36 in]	
DN-EMXM1EC1	*DN-EMXM1EC2*	as shown on next page		
DN-EMXDVEC1	*DN-EMXDVEC2*			
DN-EMXDVSPA1	*DN-EMXM1SPA1*			
DN-FESPA	*DN-FESPA-10*			
DN-FESEP	*DN-FESEP-10*			
DN-QEC12	*DN-QEC12MN*	50mm [1.97 in]	23mm [0.9 in]	1.5 mm [0.06 in]
DN-QEC10	*DN-QEC10MN*	57.4 mm [2.26 in]	33.6 mm [1.32 in]	
DN-QEC8	*DN-QEC8MN*	63mm [2.48 in]	38.5 mm [1.52 in]	
DN-QEC12-1-2	–	68.5 mm [2.70 in]	28.5 mm [1.12 in]	
DN-QEC12-2-2	–	87.5 mm [3.44 in]	28.5 mm [1.12 in]	
DN-QDEC12	–	98mm [3.86 in]	37mm [1.46 in]	

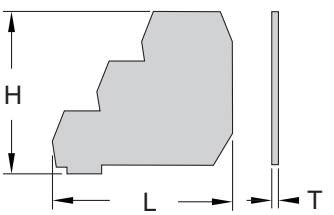
DN-EC1210, DN-EC1210MN DN-EC86, DN-EC86MN DN-EC4 (MN), DN-EC1/0 (MN), DN-ECKBD (MN), DN-S1210, DN-S1210MN, DN-S86 (MN)



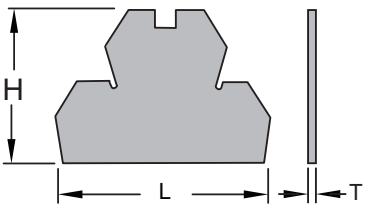
DN-EC14



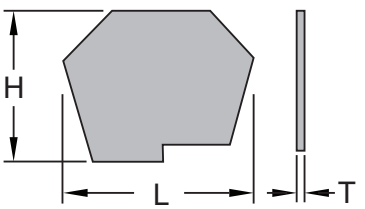
DN-EC14S



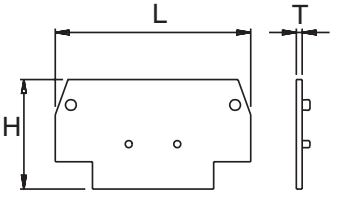
DN-DEC10 / DN-DEC10MN



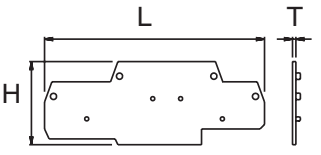
DN-ECM10
DN-ECM10MN



DN-QEC12, DN-QEC12MN, DN-QEC10, DN-QEC10MN, DN-QEC8, DN-QEC8MN, DN-QEC12-1-2, DN-QEC12-2-2



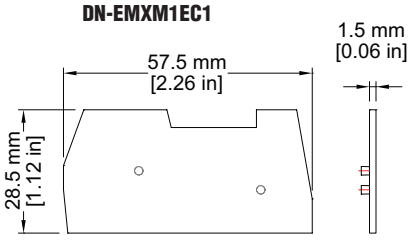
DN-QDEC



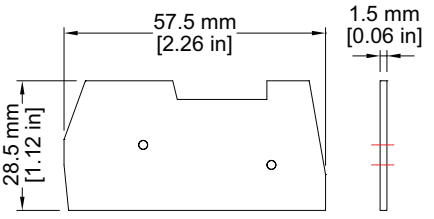
DINnectors® Accessories

Dimensional Drawings

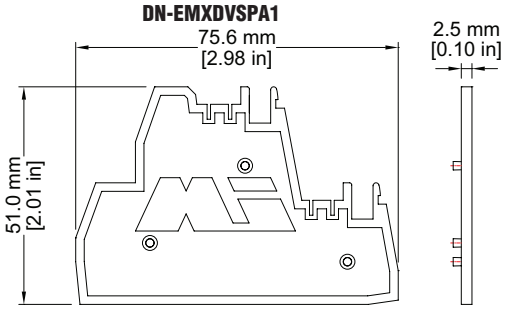
DN-EMXM1EC1



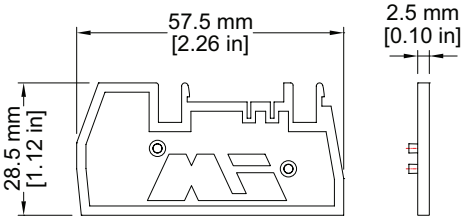
DN-EMXM1EC2



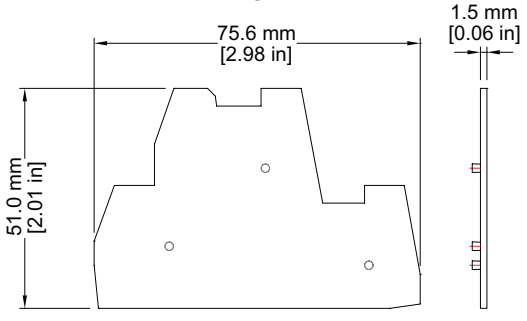
DN-EMXDVSPA1



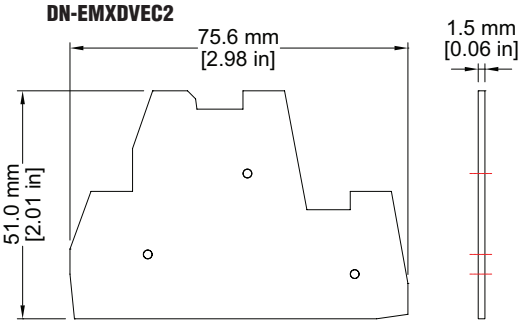
DN-EMXM1SPA1



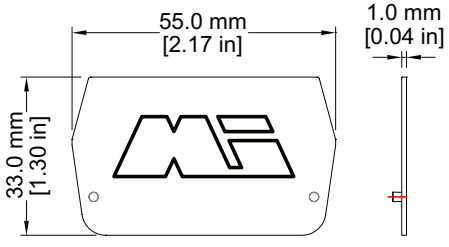
DN-EMXDVEC1



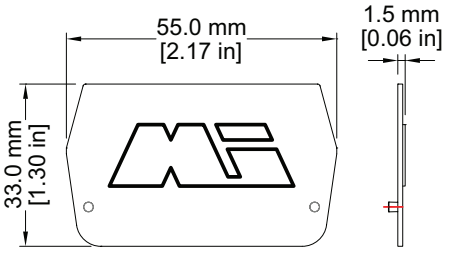
DN-EMXDVEC2



DN-FESEP,
DN-FESEP-10

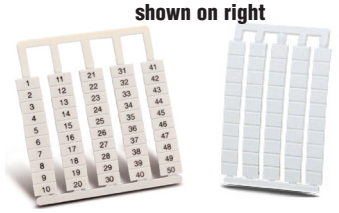


DN-FESPA, DN-FESPA-10



DINnectors® Accessories

DN-LB (blank) shown on right

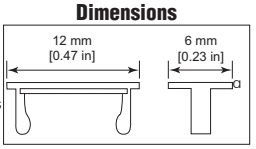


DN-L

- **Fits terminal block types**: All except Screwless DINnectors , DN-T12-A, DN-M10-A, DN-MG, and DN-TL series
- **Material**: Thermoplastic with heat embossed black print

Note:
1. The marking sequence of 50 tags (i.e. 101-150) is printed 10 times in each package of 500 tags.
2. The DN-L tags fit all DIN*nectors* 6mm wide and wider.
3. The DN-L tags fit all DIN*nectors* 6mm wide and wider but will leave gap between tags on blocks wider than 6mm.

Dimensions



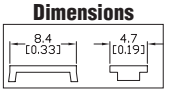
Marking Sequence	Part#	Pcs/ Pkg	Price
1-50	**DN-L50**	500	$32.50
51-100	**DN-L100**	500	$32.50
101-150	**DN-L150**	500	$32.50
151-200	**DN-L200**	500	$32.50
201-250	**DN-L250**	500	$32.50
251-300	**DN-L300**	500	$32.50
301-350	**DN-L350**	500	$32.50
351-400	**DN-L400**	500	$32.50
401-450	**DN-L450**	500	$32.50
Blank	**DN-LB**	500	$22.00
L1, L2, L3, L, N, GND, +, -, COM,COM*	**DN-LS**	500	$32.50

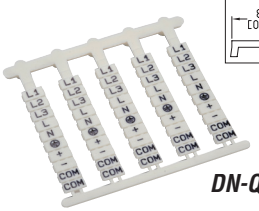
DN-QL

- **Fits terminal block types:** Screwless DN-Q series
- **Material:** Thermoplastic with heat embossed black print. Packaged 100 labels per card, and five cards per box.

Note:
1. The marking sequence (i.e. 1-100) is printed five times in each package of 500 tags.

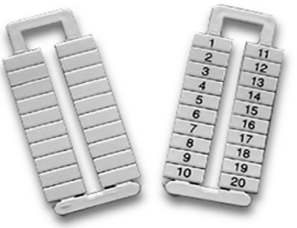
Dimensions





DN-QLS Shown

Marking Sequence	Part #	Pcs/ Pkg	Price
1-100	**DN-QL100**	500	$25.50
101-200	**DN-QL200**	500	$25.50
201-300	**DN-QL300**	500	$25.50
301.400	**DN-QL400**	500	$25.50
401-500	**DN-QL500**	500	$25.50
Blank Tags	**DN-QLB**	500	$21.50
L1, L2, L3, L, N⏚+,-, COM,COM*	**DN-QLS**	500	$29.00



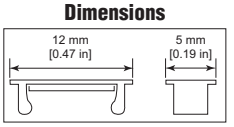
DN-LAB (blank) shown on left; part of DN-LA100 on right

DN-LA

- **Fits terminal block types:** DN-T12-A series
- **Material:** Thermoplastic with heat embossed black print

Note:
1. The marking sequence (i.e. 1-100) is printed five times in each package of 500 tags.
2. The DN-T12-A series is 5mm wide, so the 6mm wide DN-L tags do not fit these blocks.
3. The DN-LA tags fit all DIN*nectors* 5mm wide and wider but will leave a gap between tags on blocks wider than 5mm.

Dimensions



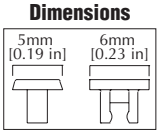
Marking Sequence	Part#	Pcs/ Pkg	Price
1-100	**DN-LA100**	500	$32.50
101-200	**DN-LA200**	500	$32.50
201-300	**DN-LA300**	500	$32.50
301-400	**DN-LA400**	500	$32.50
Blank Tags	**DN-LAB**	500	$32.50
L1, L2, L3, L, N, GND, +, -, COM,COM*	**DN-LAS**	500	$32.50

DN-LAT-A

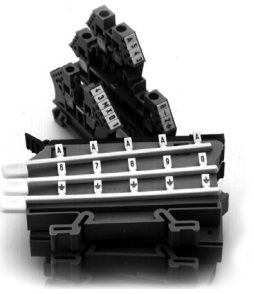
- **Fits terminal block types:** Triple level DN-TL14
  Material: Thermoplastic with heat embossed black print

Note:
1. The marking sequence (i.e. 1-100) is printed five times in each package of 500 tags.

Dimensions



Marking Sequence	Part #	Pcs/ Pkg	Price
1-100	**DN-LAT100-A**	500	$29.00
101-200	**DN-LAT200-A**	500	$29.00
201-300	**DN-LAT300-A**	500	$29.00
301-400	**DN-LAT400-A**	500	$29.00
401-500	**DN-LAT500-A**	500	$29.00
501-600	**DN-LAT600-A**	500	$29.00
Blank Tags	**DN-LATB-A**	500	$21.00
L1, L2, L3, L, N,⏚ +,-, COM,COM*	**DN-LATS-A**	500	$29.00



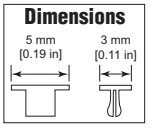
DN-LTA marker shown top; DN-LT60 marker shown middle; DN-LTGND shown bottom

DN-LT

- **Fits terminal block types:** All except **Screwless DIN***nectors* (see DN-QL series)
- **Material:** Thermoplastic with heat embossed black print

Note:
1. These marking tags allow the flexibility of creating custom marking sequences on site.
2. The DN-M10-A support a maximum of three digits (tags), while other DIN*nectors* support up to four digits (tags)

Dimensions



Marking Sequence	Part#	Pcs/ Pkg	Price
1-5	**DN-LT15**	100	$5.75
6-0	**DN-LT60**	100	$5.75
1	**DN-LT1**	100	$5.75
2	**DN-LT2**	100	$5.75
3	**DN-LT3**	100	$5.75
4	**DN-LT4**	100	$5.75
5	**DN-LT5**	100	$5.75
6	**DN-LT6**	100	$5.75
7	**DN-LT7**	100	$5.75
8	**DN-LT8**	100	$5.75
9	**DN-LT9**	100	$5.75
0	**DN-LT0**	100	$5.75
Unprinted	**DN-LTBLNK**	100	$5.75
A	**DN-LTA**	100	$5.75
B	**DN-LTB**	100	$5.75
C	**DN-LTC**	100	$5.75
D	**DN-LTD**	100	$5.75
E	**DN-LTE**	100	$5.75
F	**DN-LTF**	100	$5.75
G	**DN-LTG**	100	$5.75
H	**DN-LTH**	100	$5.75
I	**DN-LTI**	100	$5.75
J	**DN-LTJ**	100	$5.75
K	**DN-LTK**	100	$5.75
L	**DN-LTL**	100	$5.75
M	**DN-LTM**	100	$5.75
N	**DN-LTN**	100	$5.75
–	–	–	–
P	**DN-LTP**	100	$5.75
Q	**DN-LTQ**	100	$5.75
R	**DN-LTR**	100	$5.75
S	**DN-LTS**	100	$5.75
T	**DN-LTT**	100	$5.75
U	**DN-LTU**	100	$5.75
V	**DN-LTV**	100	$5.75
W	**DN-LTW**	100	$5.75
X	**DN-LTX**	100	$5.75
Y	**DN-LTY**	100	$5.75
Z	**DN-LTZ**	100	$5.75
⏚	**DN-LTGND**	100	$5.75
+	**DN-LTPOS**	100	$5.75
-	**DN-LTNEG**	100	$5.75
~	**DN-LTAC**	100	$5.75
=	**DN-LTDC**	100	$5.75

DINnectors® Accessories

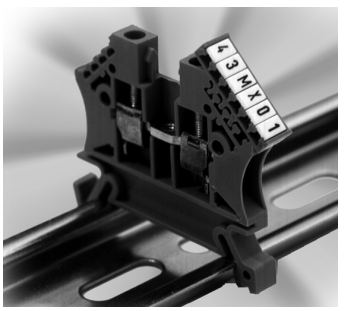
Terminal Marking Accessories

DN-EMLBL1

DN-EMLBL2

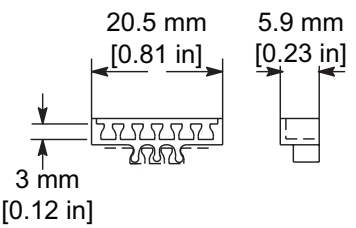
DN-EMLBL3

Part #	Description	For Use With	Pcs/Pkg	Price Each
DN-EMLBL1	Blank labels	DN-EMPEG1 pin protectors for DN-xEMXxx plug-in terminal blocks	100	$5.25
DN-EMLBL2	Labels printed 1 – 12		100	$7.25
DN-EMLBL3	Labels printed 13 – 24		100	$7.25



DN-MTA marking tag adapter

DN-MTA dimensions



Part#	Description	Pcs/Pkg	Price Each
DN-MTA	Marking tag adapter holds up to six DN-LT tags	50	$8.00

Note: DN-MTA adapter does not fit DN-T12-A terminal blocks.

Marking Pen – for terminal and wire marking tags

- Permanent
- Smudge-proof
- Waterproof
- Weatherproof
- Lightfast (won't fade)
- Dries in seconds (excellent for left-handed users)
- Dry-safe (pen can be left uncapped for days without drying out)
- Low odor ink

Part#	Description	Pcs/Pkg	Price Each
DN-MP	Indelible black ink marking pen	1	$3.75

Marking pen

Wire Marking Accessories

DN-WMTAG1 wire tags & DN-WM-x wire tag holders

Part #	Description	For Use With	Pcs/Pkg	Price Each
DN-WMTAG1	Wire tag – blank	all DN-WM-x wire tag holders	525	$34.50
DN-WM-1	Wire tag holder, clear, 12mm length, 0.051–0.118 in diameter; for 22–16 AWG wire	DN-WMTAG1	200	$7.00
DN-WM-2	Wire tag holder, clear, 12mm length, 0.098–0.196 in diameter; for 16-11 AWG wire		200	$7.00
DN-WM-3	Wire tag holder, clear, 12mm length, 0.157–0.393 in diameter; for 13–5 AWG wire		100	$4.75
DN-WM-4	Wire tag holder, clear, 12mm length, 0.314–0.629 in diameter; for 5AWG wire		100	$4.25

Ground modular terminal block - USLKG 5 - 0441504

Please be informed that the data shown in this PDF Document is generated from our Online Catalog. Please find the complete data in the user's documentation. Our General Terms of Use for Downloads are valid (http://phoenixcontact.com/download)

Ground modular terminal block, connection method: Screw connection, number of connections: 2, number of positions: 1, cross section:0.2 mm² - 6 mm², AWG: 24 - 10, width: 6.2 mm, color: green-yellow, mounting type: NS 35/7,5, NS 35/15, NS 32

Key Commercial Data

Packing unit	1 STK
GTIN	4 017918 002190
GTIN	4017918002190
Weight per Piece (excluding packing)	20.800 g
Custom tariff number	85369010
Country of origin	Germany

Technical data

General

Note	When aligning with a feed-through terminal block with the same shape, an end cover must be interposed with insulation voltages of > 690 V
Number of positions	1
Number of levels	1
Number of connections	2
Nominal cross section	4 mm²
Color	green-yellow
Insulating material	PA
Flammability rating according to UL 94	V0
Rated surge voltage	8 kV
Degree of pollution	3

Ground modular terminal block - USLKG 5 - 0441504

Technical data

General

Overvoltage category	III
Insulating material group	I
Maximum power dissipation for nominal condition	1.02 W
Open side panel	No
Terminal block mounting	0.6 Nm ... 0.8 Nm (PE foot with mounting screw, M3)
Relative insulation material temperature index (Elec., UL 746 B)	130 °C
Temperature index of insulation material (DIN EN 60216-1 (VDE 0304-21))	125 °C
Static insulating material application in cold	-60 °C
Behavior in fire for rail vehicles (DIN 5510-2)	Test passed
Flame test method (DIN EN 60695-11-10)	V0
Oxygen index (DIN EN ISO 4589-2)	>32 %
NF F16-101, NF F10-102 Class I	2
NF F16-101, NF F10-102 Class F	2
Surface flammability NFPA 130 (ASTM E 162)	passed
Specific optical density of smoke NFPA 130 (ASTM E 662)	passed
Smoke gas toxicity NFPA 130 (SMP 800C)	passed
Calorimetric heat release NFPA 130 (ASTM E 1354)	27,5 MJ/kg
Fire protection for rail vehicles (DIN EN 45545-2) R22	HL 1 - HL 3
Fire protection for rail vehicles (DIN EN 45545-2) R23	HL 1 - HL 3
Fire protection for rail vehicles (DIN EN 45545-2) R24	HL 1 - HL 3
Fire protection for rail vehicles (DIN EN 45545-2) R26	HL 1 - HL 3

Dimensions

Width	6.2 mm
Length	42.5 mm
Height NS 35/7,5	47 mm
Height NS 35/15	54.5 mm
Height NS 32	52 mm

Connection data

Note	Please observe the current carrying capacity of the DIN rails.
Connection method	Screw connection
Connection in acc. with standard	IEC 60947-7-2
Conductor cross section solid min.	0.2 mm²
Conductor cross section solid max.	6 mm²
Conductor cross section AWG min.	24
Conductor cross section AWG max.	10
Conductor cross section flexible min.	0.2 mm²

Ground modular terminal block - USLKG 5 - 0441504

Technical data

Connection data

Conductor cross section flexible max.	4 mm²
Min. AWG conductor cross section, flexible	24
Max. AWG conductor cross section, flexible	12
Conductor cross section flexible, with ferrule without plastic sleeve min.	0.25 mm²
Conductor cross section flexible, with ferrule without plastic sleeve max.	4 mm²
Conductor cross section flexible, with ferrule with plastic sleeve min.	0.25 mm²
Conductor cross section flexible, with ferrule with plastic sleeve max.	2.5 mm²
2 conductors with same cross section, solid min.	0.2 mm²
2 conductors with same cross section, solid max.	1.5 mm²
2 conductors with same cross section, stranded min.	0.2 mm²
2 conductors with same cross section, stranded max.	1.5 mm²
2 conductors with same cross section, stranded, TWIN ferrules with plastic sleeve, min.	0.5 mm²
2 conductors with same cross section, stranded, TWIN ferrules with plastic sleeve, max.	2.5 mm²
2 conductors with same cross section, stranded, ferrules without plastic sleeve, min.	0.25 mm²
2 conductors with same cross section, stranded, ferrules without plastic sleeve, max.	1.5 mm²
Connection in acc. with standard	IEC/EN 60079-7
Conductor cross section solid min.	0.2 mm²
Conductor cross section solid max.	4 mm²
Conductor cross section AWG min.	24
Conductor cross section AWG max.	12
Conductor cross section flexible min.	0.2 mm²
Conductor cross section flexible max.	4 mm²
Stripping length	8 mm
Screw thread	M3
Tightening torque, min	0.6 Nm
Tightening torque max	0.8 Nm

Standards and Regulations

Connection in acc. with standard	CSA
	IEC 60947-7-2
Flammability rating according to UL 94	V0
Fire protection for rail vehicles (DIN EN 45545-2) R22	HL 1 - HL 3 HL 1 - HL 3 HL 1 - HL 3 HL 1 - HL 3
Fire protection for rail vehicles (DIN EN 45545-2) R23	HL 1 - HL 3 HL 1 - HL 3 HL 1 - HL 3 HL 1 - HL 3
Fire protection for rail vehicles (DIN EN 45545-2) R24	HL 1 - HL 3 HL 1 - HL 3 HL 1 - HL 3 HL 1 - HL 3
Fire protection for rail vehicles (DIN EN 45545-2) R26	HL 1 - HL 3 HL 1 - HL 3 HL 1 - HL 3 HL 1 - HL 3

Ground modular terminal block - USLKG 5 - 0441504

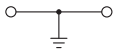
Technical data

Environmental Product Compliance

China RoHS	Environmentally Friendly Use Period = 50
	For details about hazardous substances go to tab “Downloads”, Category “Manufacturer's declaration”

Drawings

Circuit diagram



Classifications

eCl@ss

eCl@ss 4.0	27141118
eCl@ss 4.1	27141118
eCl@ss 5.0	27141118
eCl@ss 5.1	27141118
eCl@ss 6.0	27141141
eCl@ss 7.0	27141141
eCl@ss 8.0	27141141
eCl@ss 9.0	27141141

ETIM

ETIM 2.0	EC000901
ETIM 3.0	EC000901
ETIM 4.0	EC000901
ETIM 5.0	EC000901
ETIM 6.0	EC000901

UNSPSC

UNSPSC 6.01	30211811
UNSPSC 7.0901	39121410
UNSPSC 11	39121410
UNSPSC 12.01	39121410
UNSPSC 13.2	39121410

Approvals

Approvals

Ground modular terminal block - USLKG 5 - 0441504

Approvals

Approvals

CSA / UL Recognized / KEMA-KEUR / cUL Recognized / BV / PRS / KR / EAC / EAC / IECEE CB Scheme / DNV GL / cULus Recognized

Ex Approvals

IECEx / ATEX / EAC Ex

Approval details

CSA		http://www.csagroup.org/services-industries/product-listing/	13631

mm²/AWG/kcmil	26-10

UL Recognized		http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm	FILE E 60425

mm²/AWG/kcmil	26-10

KEMA-KEUR		http://www.dekra-certification.com	2191246.01

mm²/AWG/kcmil	4

cUL Recognized		http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm	FILE E 60425

mm²/AWG/kcmil	26-10

BV		http://www.veristar.com/portal/veristarinfo/generalinfo/approved/approvedProducts/equipmentAndMaterials	07774/D0 BV

Ground modular terminal block - USLKG 5 - 0441504

Approvals

PRS	http://www.prs.pl/	TE/1824/880590/09
KR	http://www.krs.co.kr/eng/main/main.aspx	HMB17372-EL001
EAC		EAC-Zulassung
EAC		7500651.22.01.00246
IECEE CB Scheme	http://www.iecee.org/	NL-39913

mm²/AWG/kcmil	4

DNV GL	http://exchange.dnv.com/tari/	TAE00001CT
cULus Recognized	http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm	

Accessories

Accessories

DIN rail

DIN rail perforated - NS 32 PERF 2000MM - 1201002

DIN rail perforated, G profile, width: 32 mm, height: 15 mm, in acc. with EN 60715: 2001, material: Steel, galvanized, passivated with a thick layer, length: 2000 mm, color: silver

Feed-through terminal block - UK 5 N - 3004362

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Feed-through terminal block, nom. voltage: 800 V, nominal current: 32 A, connection method: Screw connection, number of connections: 2, cross section:0.2 mm² - 6 mm², AWG: 24 - 10, width: 6.2 mm, color: gray, mounting type: NS 35/7,5, NS 35/15, NS 32

Why buy this product

- Universal foot which can be used on NS 35... and NS 32... DIN rails
- The UK universal screw terminal block series has the typical features which are decisive for practical applications
- Potential distribution via fixed bridges in the terminal center or insertion bridges in the clamping space

Key Commercial Data

Packing unit	1 STK
Minimum order quantity	50 STK
GTIN	4 017918 090760
GTIN	4017918090760
Weight per Piece (excluding packing)	8.795 g
Custom tariff number	85369010
Country of origin	Germany

Technical data

General

Note	Other languages
Number of levels	1
Number of connections	2
Potentials	1
Nominal cross section	4 mm²

Feed-through terminal block - UK 5 N - 3004362

Technical data

General

Color	gray
Insulating material	PA
Flammability rating according to UL 94	V0
Rated surge voltage	8 kV
Degree of pollution	3
Overvoltage category	III
Insulating material group	I
Maximum power dissipation for nominal condition	1.02 W
Maximum load current	41 A (with 6 mm² conductor cross section)
Nominal current I_N	32 A
Nominal voltage U_N	800 V
Open side panel	Yes
Shock protection test specification	IEC 60529:1989-11 + AMD 1:1999-11 + AMD 2:2013-08
Back of the hand protection	guaranteed
Finger protection	guaranteed
Result of surge voltage test	Test passed
Surge voltage test setpoint	9.8 kV
Result of power-frequency withstand voltage test	Test passed
Power frequency withstand voltage setpoint	2 kV
Result of the test for mechanical stability of terminal points (5 x conductor connection)	Test passed
Result of bending test	Test passed
Bending test rotation speed	10 rpm
Bending test turns	135
Bending test conductor cross section/weight	0.2 mm² / 0.2 kg
	4 mm² / 0.9 kg
	6 mm^2 / 1.4 kg
Tensile test result	Test passed
Conductor cross section tensile test	0.2 mm²
Tractive force setpoint	10 N
Conductor cross section tensile test	4 mm²
Tractive force setpoint	60 N
Conductor cross section tensile test	6 mm²
Tractive force setpoint	80 N
Result of tight fit on support	Test passed
Tight fit on carrier	NS 32/NS 35
Setpoint	5 N

Feed-through terminal block - UK 5 N - 3004362

Technical data

General

Result of voltage-drop test	Test passed
Requirements, voltage drop	≤ 3.2 mV
Result of temperature-rise test	Test passed
Short circuit stability result	Test passed
Conductor cross section short circuit testing	4 mm²
Short-time current	0.48 kA
Result of thermal test	Test passed
Proof of thermal characteristics (needle flame) effective duration	30 s
Oscillation, broadband noise test result	Test passed
Test specification, oscillation, broadband noise	DIN EN 50155 (VDE 0115-200):2008-03
Test spectrum	Service life test category 1, class B, body mounted
ASD level	1.857 $(m/s^2)^2$/Hz
Acceleration	0,8 g
Test duration per axis	5 h
Test directions	X-, Y- and Z-axis
Shock test result	Test passed
Test specification, shock test	DIN EN 50155 (VDE 0115-200):2008-03
Shock form	Half-sine
Acceleration	5g (10-150-10 Hz)
Shock duration	30 ms
Number of shocks per direction	3
Test directions	X-, Y- and Z-axis (pos. and neg.)
Relative insulation material temperature index (Elec., UL 746 B)	130 °C
Temperature index of insulation material (DIN EN 60216-1 (VDE 0304-21))	130 °C
Static insulating material application in cold	-60 °C
Behavior in fire for rail vehicles (DIN 5510-2)	Test passed
Flame test method (DIN EN 60695-11-10)	V0
Oxygen index (DIN EN ISO 4589-2)	>32 %
NF F16-101, NF F10-102 Class I	2
NF F16-101, NF F10-102 Class F	2
Surface flammability NFPA 130 (ASTM E 162)	passed
Specific optical density of smoke NFPA 130 (ASTM E 662)	passed
Smoke gas toxicity NFPA 130 (SMP 800C)	passed
Calorimetric heat release NFPA 130 (ASTM E 1354)	27,5 MJ/kg
Fire protection for rail vehicles (DIN EN 45545-2) R22	HL 1 - HL 3
Fire protection for rail vehicles (DIN EN 45545-2) R23	HL 1 - HL 3
Fire protection for rail vehicles (DIN EN 45545-2) R24	HL 1 - HL 3

Feed-through terminal block - UK 5 N - 3004362

Technical data

General

Fire protection for rail vehicles (DIN EN 45545-2) R26	HL 1 - HL 3

Dimensions

Width	6.2 mm
End cover width	1.8 mm
Length	42.5 mm
Height NS 35/7,5	47 mm
Height NS 35/15	54.5 mm
Height NS 32	52 mm

Connection data

Connection method	Screw connection
Connection in acc. with standard	IEC 60947-7-1
Conductor cross section solid min.	0.2 mm²
Conductor cross section solid max.	6 mm²
Conductor cross section AWG min.	24
Conductor cross section AWG max.	10
Conductor cross section flexible min.	0.2 mm²
Conductor cross section flexible max.	4 mm²
Min. AWG conductor cross section, flexible	24
Max. AWG conductor cross section, flexible	12
Conductor cross section flexible, with ferrule without plastic sleeve min.	0.25 mm²
Conductor cross section flexible, with ferrule without plastic sleeve max.	4 mm²
Conductor cross section flexible, with ferrule with plastic sleeve min.	0.25 mm²
Conductor cross section flexible, with ferrule with plastic sleeve max.	2.5 mm²
Cross section with insertion bridge, solid max.	4 mm²
Cross section with insertion bridge, stranded max.	4 mm²
2 conductors with same cross section, solid min.	0.2 mm²
2 conductors with same cross section, solid max.	1.5 mm²
2 conductors with same cross section, stranded min.	0.2 mm²
2 conductors with same cross section, stranded max.	1.5 mm²
2 conductors with same cross section, stranded, TWIN ferrules with plastic sleeve, min.	0.5 mm²
2 conductors with same cross section, stranded, TWIN ferrules with plastic sleeve, max.	2.5 mm²
2 conductors with same cross section, stranded, ferrules without plastic sleeve, min.	0.25 mm²
2 conductors with same cross section, stranded, ferrules without plastic sleeve, max.	1.5 mm²
Cross section with insertion bridge, solid max.	4 mm²

Feed-through terminal block - UK 5 N - 3004362

Technical data

Connection data

Cross section with insertion bridge, stranded max.	4 mm²
Connection in acc. with standard	IEC/EN 60079-7
Conductor cross section solid min.	0.2 mm²
Conductor cross section solid max.	6 mm²
Conductor cross section AWG min.	24
Conductor cross section AWG max.	10
Conductor cross section flexible min.	0.2 mm²
Conductor cross section flexible max.	4 mm²
Stripping length	8 mm
Internal cylindrical gage	A4
Screw thread	M3
Tightening torque, min	0.6 Nm
Tightening torque max	0.8 Nm

Standards and Regulations

Connection in acc. with standard	CSA
	IEC 60947-7-1
Flammability rating according to UL 94	V0
Fire protection for rail vehicles (DIN EN 45545-2) R22	HL 1 - HL 3 HL 1 - HL 3 HL 1 - HL 3 HL 1 - HL 3
Fire protection for rail vehicles (DIN EN 45545-2) R23	HL 1 - HL 3 HL 1 - HL 3 HL 1 - HL 3 HL 1 - HL 3
Fire protection for rail vehicles (DIN EN 45545-2) R24	HL 1 - HL 3 HL 1 - HL 3 HL 1 - HL 3 HL 1 - HL 3
Fire protection for rail vehicles (DIN EN 45545-2) R26	HL 1 - HL 3 HL 1 - HL 3 HL 1 - HL 3 HL 1 - HL 3

Environmental Product Compliance

China RoHS	Environmentally Friendly Use Period = 25;
	For details about hazardous substances go to tab “Downloads”, Category “Manufacturer's declaration”

Drawings

Circuit diagram

Classifications

eCl@ss

eCl@ss 4.0	27141120
eCl@ss 4.1	27141120

Feed-through terminal block - UK 5 N - 3004362

Classifications

eCl@ss

eCl@ss 5.0	27141120
eCl@ss 5.1	27141120
eCl@ss 6.0	27141120
eCl@ss 7.0	27141120
eCl@ss 8.0	27141120
eCl@ss 9.0	27141120

ETIM

ETIM 2.0	EC000897
ETIM 3.0	EC000897
ETIM 4.0	EC000897
ETIM 5.0	EC000897
ETIM 6.0	EC000897

UNSPSC

UNSPSC 6.01	30211811
UNSPSC 7.0901	39121410
UNSPSC 11	39121410
UNSPSC 12.01	39121410
UNSPSC 13.2	39121410

Approvals

Approvals

Approvals

CSA / UL Recognized / KEMA-KEUR / cUL Recognized / LR / PRS / KR / NK / IECEE CB Scheme / LR / EAC / EAC / DNV GL / LR / cULus Recognized

Ex Approvals

IECEx / ATEX / EAC Ex / UL Recognized / cUL Recognized / cULus Recognized

Approval details

Feed-through terminal block - UK 5 N - 3004362

Approvals

CSA		http://www.csagroup.org/services-industries/product-listing/	13631

mm²/AWG/kcmil	28-10
Nominal current IN	30 A
Nominal voltage UN	600 V

UL Recognized		http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm	FILE E 60425

mm²/AWG/kcmil	30-10
Nominal current IN	30 A
Nominal voltage UN	600 V

KEMA-KEUR		http://www.dekra-certification.com	2183462.01

mm²/AWG/kcmil	4
Nominal voltage UN	800 V

cUL Recognized		http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm	FILE E 60425

	B	C
mm²/AWG/kcmil	30-10	30-10
Nominal current IN	30 A	30 A
Nominal voltage UN	600 V	600 V

LR		http://www.lr.org/en	96/20013

mm²/AWG/kcmil	10
Nominal current IN	57 A
Nominal voltage UN	800 V

Feed-through terminal block - UK 5 N - 3004362

Approvals

PRS	http://www.prs.pl/	TE/1824/880590/09

KR	http://www.krs.co.kr/eng/main/main.aspx	HMB17372-EL001

NK	http://www.classnk.or.jp/hp/en/	09 ME 141

IECEE CB Scheme	http://www.iecee.org/	NL-26110

mm²/AWG/kcmil	4
Nominal voltage UN	800 V

LR	http://www.lr.org/en	96/20013

EAC	EAC-Zulassung

EAC	7500651.22.01.00246

DNV GL	http://exchange.dnv.com/tari/	TAE00001CT

LR	http://www.lr.org/en	96/20013

mm²/AWG/kcmil	2.5

Feed-through terminal block - UK 5 N - 3004362

Approvals

Nominal current IN	24 A
Nominal voltage UN	800 V

cULus Recognized	c UL us	http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm

Accessories

Accessories

Bridge

Fixed bridge - FB-150 METER - 0201595

Cross connection rail, for fixed bridging of identical inputs and outputs, made of Cu, nickel-plated, 1 m long

Cover profile

Cover - EA 5 - 1024014

Single covers, color: transparent

Cover - EA 5-WS - 1024085

Single covers, for covering one terminal block, with black symbol (lightning flash) snap fit, color: transparent/yellow

DIN rail

Partition plate - ATP-UK - 3003224

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Partition plate, length: 56 mm, width: 1.5 mm, height: 45.7 mm, color: gray

RoHS

Key Commercial Data

Packing unit	1 STK
Minimum order quantity	50 STK
GTIN	4 017918 090500
GTIN	4017918090500
Weight per Piece (excluding packing)	3.600 g
Custom tariff number	85472000
Country of origin	Germany

Technical data

General

Color	gray
Material	PA
Flammability rating according to UL 94	V2

Dimensions

Width	1.5 mm
Length	56 mm
Height	45.7 mm

General

Relative insulation material temperature index (Elec., UL 746 B)	130 °C

Partition plate - ATP-UK - 3003224

Technical data

General

Temperature index of insulation material (DIN EN 60216-1 (VDE 0304-21))	130 °C
Static insulating material application in cold	-60 °C
Behavior in fire for rail vehicles (DIN 5510-2)	Test passed
Flame test method (DIN EN 60695-11-10)	V0
Oxygen index (DIN EN ISO 4589-2)	>32 %
NF F16-101, NF F10-102 Class I	2
NF F16-101, NF F10-102 Class F	2
Surface flammability NFPA 130 (ASTM E 162)	passed
Specific optical density of smoke NFPA 130 (ASTM E 662)	passed
Smoke gas toxicity NFPA 130 (SMP 800C)	passed
Calorimetric heat release NFPA 130 (ASTM E 1354)	28 MJ/kg
Fire protection for rail vehicles (DIN EN 45545-2) R22	HL 1 - HL 3
Fire protection for rail vehicles (DIN EN 45545-2) R23	HL 1 - HL 3
Fire protection for rail vehicles (DIN EN 45545-2) R24	HL 1 - HL 3
Fire protection for rail vehicles (DIN EN 45545-2) R26	HL 1 - HL 3

Standards and Regulations

Flammability rating according to UL 94	V2
Fire protection for rail vehicles (DIN EN 45545-2) R22	HL 1 - HL 3 HL 1 - HL 3 HL 1 - HL 3 HL 1 - HL 3
Fire protection for rail vehicles (DIN EN 45545-2) R23	HL 1 - HL 3 HL 1 - HL 3 HL 1 - HL 3 HL 1 - HL 3
Fire protection for rail vehicles (DIN EN 45545-2) R24	HL 1 - HL 3 HL 1 - HL 3 HL 1 - HL 3 HL 1 - HL 3
Fire protection for rail vehicles (DIN EN 45545-2) R26	HL 1 - HL 3 HL 1 - HL 3 HL 1 - HL 3 HL 1 - HL 3

Environmental Product Compliance

China RoHS	Environmentally friendly use period: unlimited = EFUP-e
	No hazardous substances above threshold values

Classifications

eCl@ss

eCl@ss 4.0	27141199
eCl@ss 4.1	27141199
eCl@ss 5.0	27141145
eCl@ss 5.1	27141145
eCl@ss 6.0	27141133
eCl@ss 7.0	27141133
eCl@ss 8.0	27141133
eCl@ss 9.0	27141133

Partition plate - ATP-UK - 3003224

Classifications

ETIM

ETIM 2.0	EC000886
ETIM 3.0	EC000886
ETIM 4.0	EC000886
ETIM 5.0	EC000886
ETIM 6.0	EC000886

UNSPSC

UNSPSC 6.01	30211828
UNSPSC 7.0901	39121425
UNSPSC 11	39121425
UNSPSC 12.01	39121425
UNSPSC 13.2	39121425

End clamp - E/NS 35 N - 0800886

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End clamp, width: 9.5 mm, color: gray

Why buy this product

- Large-surface labeling

RoHS

Key Commercial Data

Packing unit	1 STK
Minimum order quantity	50 STK
GTIN	4 017918 129309
GTIN	4017918129309
Weight per Piece (excluding packing)	14.800 g
Custom tariff number	39269097
Country of origin	Germany

Technical data

Dimensions

Height	32.8 mm
Length	48.6 mm
Width	9.5 mm

General

Material	PA
Color	gray

Standards and Regulations

End clamp - E/NS 35 N - 0800886

Technical data

Standards and Regulations

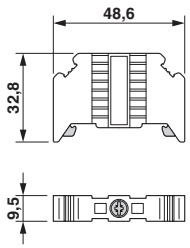
Flammability rating according to UL 94	V0

Environmental Product Compliance

China RoHS	Environmentally friendly use period: unlimited = EFUP-e
	No hazardous substances above threshold values

Drawings

Dimensional drawing



Classifications

eCl@ss

eCl@ss 4.0	27141199
eCl@ss 4.1	27141199
eCl@ss 5.0	27141135
eCl@ss 5.1	27141145
eCl@ss 6.0	27141135
eCl@ss 7.0	27141135
eCl@ss 8.0	27141135
eCl@ss 9.0	27141135

ETIM

ETIM 2.0	EC000761
ETIM 3.0	EC001041
ETIM 4.0	EC001041
ETIM 5.0	EC001041
ETIM 6.0	EC001041

UNSPSC

UNSPSC 6.01	30212109
UNSPSC 7.0901	39121708

Plastic label - UC-EMLP (60X15) - 0819330

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Plastic label, Sheet, white, unlabeled, can be labeled with: BLUEMARK CLED, BLUEMARK LED, CMS-P1-PLOTTER, PLOTMARK, mounting type: adhesive, lettering field size: 60 x 15 mm

Why buy this product

- The UC-EMLP ... UniCard labeling range includes self-adhesive device markers with good adhesive properties
- The markers, which are supplied in uniform sheets, can be labeled quickly and easily using the BLUEMARK LED
- The wide temperature range means that the labels can be used in control cabinets as well as the field
- The format automatically ensures printing with a high degree of positioning accuracy
- The sheets provide space for including function texts

RoHS

Key Commercial Data

Packing unit	1 STK
Minimum order quantity	10 STK
GTIN	4 046356 152471
GTIN	4046356152471
Weight per Piece (excluding packing)	11.680 g
Custom tariff number	39269097
Country of origin	Poland

Technical data

Dimensions

Length (b)	15 mm
Width (a)	60 mm

Ambient conditions

Plastic label - UC-EMLP (60X15) - 0819330

Technical data

Ambient conditions

Ambient temperature (operation)	-40 °C ... 120 °C
Recommended storage conditions	23°C/50% relative humidity. Storage in a dry and dark place in the original packaging is recommended.

General

Color	white
Components	free from silicone and halogen
Flammability rating according to UL 94	V2
Material	PA
RoHS compliant	Yes
Wipe resistance	DIN EN 61010-1 (VDE 0411-1)
Number of individual labels	4
Number of individual labels per row	1
Adhesive	Acrylic
Printability	UV LED technology
Device	5147999 BLUEMARK CLED
Test for substances that would hinder coating with paint or varnish	VW PV 3.10.7:2005-02
Result	Test passed
Test specification weathering-resistance	Following ISO 4892-2:2013-03
Test duration	96 h
Wipe resistance test result	Test passed
Salt spray test specification	DIN EN 60068-2-11:2000-02
Test duration	96 h
Salt spray testing result	Test passed
Wipe resistance of test specification inscriptions	DIN EN 61010-1 (VDE 0411-1):2011-07
Result	Test passed
Adhesive strength	250 µm
Marking mounting type	adhesive
Result	Test passed
Oxygen index (DIN EN ISO 4589-2)	28,2%
Class I	3
Class F	2
R22	HL 1 - HL 2
R23	HL 1 - HL 2
R24	HL 1 - HL 2

Standards and Regulations

Wipe resistance	DIN EN 61010-1 (VDE 0411-1)
Flammability rating according to UL 94	V2

Plastic label - UC-EMLP (60X15) - 0819330

Technical data

Standards and Regulations

Fire protection for rail vehicles (DIN EN 45545-2) R22	HL 1 - HL 2 HL 1 - HL 2 HL 1 - HL 2
Fire protection for rail vehicles (DIN EN 45545-2) R23	HL 1 - HL 2 HL 1 - HL 2 HL 1 - HL 2
Fire protection for rail vehicles (DIN EN 45545-2) R24	HL 1 - HL 2 HL 1 - HL 2 HL 1 - HL 2
Fire protection for rail vehicles (DIN EN 45545-2) R26	HL 1 - HL 2 HL 1 - HL 2 HL 1 - HL 2

Classifications

eCl@ss

eCl@ss 4.0	24190218
eCl@ss 4.1	24190218
eCl@ss 5.0	27141137
eCl@ss 5.1	27141137
eCl@ss 6.0	27141137
eCl@ss 7.0	27141137
eCl@ss 8.0	27149129
eCl@ss 9.0	27400629

ETIM

ETIM 2.0	EC000761
ETIM 3.0	EC000761
ETIM 4.0	EC000761
ETIM 5.0	EC001288
ETIM 6.0	EC001288

UNSPSC

UNSPSC 6.01	30211811
UNSPSC 7.0901	39121410
UNSPSC 11	39121410
UNSPSC 12.01	39121410
UNSPSC 13.2	39131504

Accessories

Accessories

Magazine

Plastic label - UC-EMLP (60X15) - 0819330

Accessories

Magazine - P1 UC-MAG 6 - 5146121

Magazine, for CMS-P1-PLOTTER and PLOTMARK, for accommodating UC-EMP..., UC-EMLP...

SUBMONITOR
THREE-PHASE PROTECTION

Get the Most From Your 3-phase Motor

With Franklin Electric's SubMonitor, you can protect against adverse conditions such as low-flow wells, pump damage, clogging, bound pumps and power mishaps. SubMonitor is designed to protect three-phase motor and pump systems with ratings between 3 and 200 hp.

Current, voltage and motor temperature are monitored using three integrated current transformers. A digital display provides current and voltage readings for all three legs and allows the user to set up the SubMonitor quickly and easily. Data can be downloaded to a PC using Franklin's D3 device.

SubMonitor protects against:

- Under/Overload
- Under/Overvoltage
- False Start (Chattering)
- Current Unbalance
- Overheated Motor (Subtrol-equipped)
- Phase Reversal

Specifications:

Model Number

Premium Package	586 000 5100
Standard Unit	586 000 5000
Display Only	225 190 902
Base Only	225 210 902

Input Voltage ..... 190 – 600 VAC

Frequency ..... 60/50 Hz

Motor Service Factor Amps ..... 5 to 350 Amps

Maximum Conductor Size Through Sensors

Max Diameter ..... 0.920 in. (23 mm)

Trip Response

Motor Under/Overload, Under/Overvoltage, Overheat, Unbalance ..... 3 seconds

Control Circuit Rating ..... 1.5 Amp AC, up to 600 volts

Signal Circuit Rating ..... 1 Amp AC, up to 250 volts (Incandescent lamp: 100 watts max)

Wiring Terminals

Wire Gauge ..... #12 to #18 AWG
Tighten to ..... 4.5 in-lbs

Weight (SubMonitor) ..... 3.3 lbs/1.5 kg

Carton Size (Std. Unit) ..... 7.75 in x 11.5 in x 6.75 in (19.7 cm x 29.2 cm x 17.1 cm)

Shipping Weight (Std. Unit) ..... 3.5 lbs/1.5 kg

Agency Approval ..... UL 508 Listed

*This product is lead free.

System Solutions

Franklin Electric

Detachable Display Unit

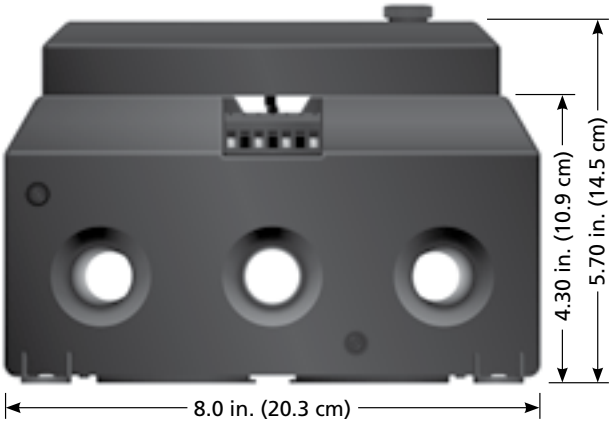
The detachable display unit displays and stores data it receives from the base unit. A communication cable connects the display to the base unit.

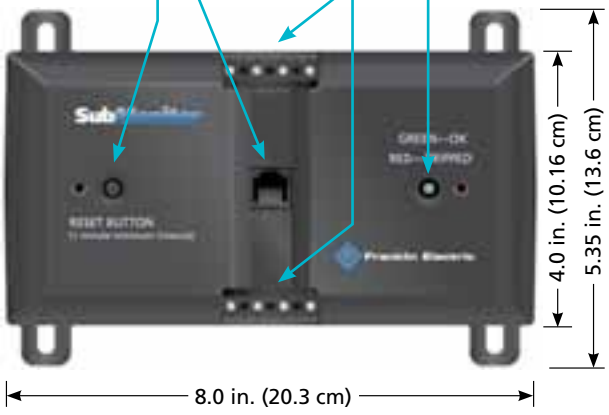
- Easy menu-driven setup and adjustment of monitoring parameters.
- Real time display of voltage and current for each leg.
- Can be mounted on panel door for easy access (mounting kit available).
- NEMA 3R enclosure.
- Password protection option.
- Fault light can be seen from a distance – indicates that a trip has occurred and that a fault message is being displayed.
- Turn-and-push adjustment knob.
- 502-event history (downloadable to PC with optional D3 unit – sold separately).

Base Unit

The base unit contains the current sensors and the electronics that monitor motor leads. It can operate independently of the detachable head.

- Can be mounted with 4 screws or with DIN rail.
- Integrated current transformers.
- Dual-colored fault light indicates.
  - Green ..... OK (system is operating normally)
  - Red ..... TRIPPED (a fault has occurred)
- Power, control and alarm terminal connectors are removable for easy access.
- Port for communication cable between base and display.
- Reset button allows manual restart after a trip has occurred.





Franklin Electric
400 East Spring Street, Bluffton, Indiana 46714 • Tel: 260.824.2900 Fax: 260.824.2909 • www.franklin-electric.com

SDSA3650 Surge Protective Device (SPD)

Dispositivo de protección contra sobretensiones transitorias (SPD) SDSA3650

Dispositif de protection contre les surtensions transitoires (SPD) SDSA3650

Series Serie Série	Type Tipo Type
002	1

Retain for future use. / Conservar para uso futuro. / À conserver pour usage ultérieur.

Introduction

The SDSA3650 Surge Protective Device is designed and listed for indoor or outdoor installations and for surge suppression of three-phase services up to 600 Vac.

Introducción

El dispositivo de protección contra sobretensiones transitorias SDSA3650 está diseñado y certificado para instalaciones en interiores o en exteriores y para proporcionar supresión de sobretensiones a acometidas de tres fases de hasta 600 V~.

Introduction

Le dispositif de protection contre les surtensions transitoires SDSA3650 est conçu et homologué pour une installation à l'intérieur ou à l'extérieur et pour la suppression des surtensions de branchements tripolaires jusqu'à 600 Vca.

Precautions

Precauciones

Précautions

⚠ DANGER / PELIGRO / DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors and covers before turning on power to this equipment.
- This equipment must be effectively grounded per all applicable codes. Use an equipment-grounding conductor to connect this equipment to the power system ground.

Failure to follow these instructions will result in death or serious injury.

PELIGRO DE DESCARGA ELÉCTRICA, EXPLOSIÓN O DESTELLO POR ARQUEO

- Utilice equipo de protección personal (EPP) apropiado y siga las prácticas de seguridad en trabajos eléctricos establecidas por su Compañía, consulte la norma 70E de NFPA y NOM-029-STPS.
- Solamente el personal eléctrico especializado deberá instalar y prestar servicio de mantenimiento a este equipo.
- Desenergice el equipo antes de realizar cualquier trabajo dentro o fuera de él.
- Siempre utilice un dispositivo detector de tensión nominal adecuado para confirmar la desenergización del equipo.
- Vuelva a colocar todos los dispositivos, las puertas y las cubiertas antes de volver a energizar el equipo.
- Este equipo deberá estar correctamente conectado a tierra de acuerdo con los códigos aplicables. Utilice un conductor de conexión a tierra del equipo para conectar este último a la tierra del sistema de alimentación.

El incumplimiento de estas instrucciones podrá causar la muerte o lesiones serias.

RISQUE D'ÉLECTROCUTION, D'EXPLOSION OU D'ÉCLAIR D'ARC

- Portez un équipement de protection personnelle (ÉPP) approprié et observez les méthodes de travail électrique sécuritaire. Voir NFPA 70E.
- Seul un personnel qualifié doit effectuer l'installation et l'entretien de cet appareil.
- Coupez toutes les alimentations de l'appareil avant d'y travailler.
- Utilisez toujours un dispositif de détection de tension à valeur nominale appropriée pour vous assurer que l'alimentation est coupée.
- Replacez tous les dispositifs, les portes et les couvercles avant de mettre l'appareil sous tension.
- Cet appareil doit être effectivement mis à la terre selon tous les codes en vigueur. Utilisez un conducteur de m.à.l.t. d'appareil pour raccorder celui-ci à la terre du système d'alimentation.

Si ces directives ne sont pas respectées, cela entraînera la mort ou des blessures graves.

CAUTION / PRECAUCIÓN / ATTENTION

LOSS OF SURGE SUPPRESSION	PÉRDIDA DE SUPRESIÓN DE SOBRETENSIONES TRANSITORIAS	PERTE DE LA SUPPRESSION DES SURTENSIONS TRANSITOIRES
Turn off all power supplying the equipment and isolate the Surge Protective Device before Megger® or hi-potential testing.	Desenergice el equipo y aísle el dispositivo de protección contra sobretensiones transitorias antes de realizar cualquier prueba de rigidez dieléctrica o con Megger®.	Coupez toute alimentation de cet appareil et isolez le dispositif de protection contre les surtensions transitoires avant de procéder à l'essai de rupture diélectrique ou avec Megger®.
Failure to follow these instructions can result in equipment damage.	**El incumplimiento de estas instrucciones puede causar daño al equipo.**	**Si ces directives ne sont pas respectées, cela peut entraîner des dommages matériels.**

Table / Tabla / Tableau 1 : General Specifications / Especificaciones generales / Spécifications générales [1] [2]

Product Catalog No. / No. de catálogo del producto / Nº de catalogue de produit	SDSA3650 (Wye) SDSA3650D (Delta)
System Voltage (U_o) / Tensión del sistema (U_o) / Tension du système (U_o)	Wye: 208Y/120 V, 380Y/220 V, 400Y/230 V, 480Y/277 V, 600Y/347 V Delta: 240 V, 480 V, 600 V, 240/120 V High-Leg Delta / extremo alto de una instalación en delta / sommet du triangle
Maximum Continuous Operating Voltage (MCOV), (U_c) / Tensión máxima de funcionamiento continuo (MCOV), (U_c) / Tension de fonctionnement continu maximale (MCOV), (U_c)	(Wye): L-N 750 V, L-L 1500 V (Delta): L-L 1500 V
Short Circuit Current Rating (SCCR) / Corriente nominal de cortocircuito (SCCR) / Courant nominal de court-circuit (SCCR)	200 kA
Nominal Discharge Current (I_n) / Corriente nominal de descarga (I_n) / Courant nominal de décharge (I_n)	10 kA
Voltage Protection Rating (VPR), (U_p) / Nivel de protección en tensión (VPR), (U_p) / Niveau de protection en tension (VPR), (U_p)	(Wye): L-N 2500 V, L-L 4000 V (Delta): L-L 4000 V
Enclosure Rating (IP Code) / Clasificación del gabinete (código IP) / Valeur nominale du coffret (code IP)	Type 4X (IP66) / Tipo 4X (IP66) / Type 4X (IP66)
Max Surge Current / Corriente transitoria máx. / Courant max. de surtension	40 kA/Phase / 40 kA/fase / 40 kA/phase
Housing Dimensions / Dimensiones de la caja / Dimensions du coffret	See Figure 4 / Vea la figura 4 / Voir la figure 4
Product Weight / Peso del producto / Poids du produit	1 lb (0.45 kg) / 0,45 kg (1 lb) / 0,45 kg (1 lb)
Connection Method / Método de conexión / Méthode de raccordement	Parallel, 12 AWG Wire / Conductor sólido calibre 3,31 mm^2 (12 AWG), paralelo / En parallèle, fil rigide de calibre 12 AWG
Thermal Fusing / Fusión térmica / Fusibles thermiques	Yes / Si / Oui
Operating Temperature / Temperatura de funcionamiento / Température de fonctionnement	-40 °F to +160 °F (-40 °C to +70 °C) / -40 °C a +70 °C (-40 °F a +160 °F) / -40 °C a +70 °C (-40 °F a +160 °F)
Operating Frequency / Frecuencia de funcionamiento / Fréquence de fonctionnement	50/60 Hz
Diagnostics / Diagnóstico / Diagnostics	Green Status LEDs / LED de estado verde / DÉL d'état verte
Product Standards / Normas del producto / Normes du produit	UL 1449 3rd Edition, rev. May 2010, C233.1-87, EN61643-11 / UL 1449 3ra edición, rev. mayo 2010, C233.1-87, EN61643-11 / UL 1449 3ème édition, rev. Mai 2010, C233.1-87, EN61643-11
Product Rating / Clasificación del producto / Valuer nominale du produit	Type 1 Surge Protective Device (SPD), (Test Class 1) / Dispositivo de protección contra sobretensiones transitorias tipo 1, (clase de prueba 1) / Dispositif de protection contre les surtensions transitoires type1, (classe d'essai 1)

[1] Contains no serviceable parts / Contiene piezas libres de mantenimiento / Ne contient aucune pièce à réparer ou entretenir

[2] Suitable for use on a circuit capable of delivering not more than 200 kA rms symmetrical Amperes. / Se puede usar en un circuito capaz de suministrar no más de 200 kA simétricos rcm. / Convient à un circuit capable de fournir pas plus de 200 kA RMS symétriques.

Installation

1. Turn off all power supplying this equipment before working on or inside equipment.
2. For mounting, see Figure 1.
3. Confirm SPD is rated for your system by comparing voltage measurements to the Line Voltage (L-L, L-N) on the product label (see Figure 2).
4. Confirm the black wires are connected to the line wires and the neutral wire is connected to the white wire (see Figure 2).

   NOTE: Delta model SDSA3650D does not include or require a white wire.
5. Twist wires 1/2 turn every 12 in. (30 cm) of length.
6. Keep conductor length as short as possible with no sharp bends.
7. Do not loop or coil wires.
8. Install cover and/or close door on equipment.

Instalación

1. Desenergice el equipo antes de realizar cualquier trabajo dentro o fuera de él.
2. Para obtener detalles de montaje, vea la figura 1.
3. Asegúrese de que el SPD sea adecuado para su sistema comparando las mediciones de tensión en la tensión de línea (L-L, L-N), especificadas en la etiqueta del producto.
4. Asegúrese de que los conductores negros estén conectados a los conductores de línea y el conductor blanco al conductor neutro (vea la figura 2).

   NOTA: El modelo SDSA3650D en delta no incluye ni requiere conductor blanco.
5. Tuerza los conductores ½ vuelta o más por cada 305 mm (12 pulgadas) de longitud.
6. Mantenga la longitud de los conductores lo más corta posible evitando doblarlos en ángulo recto.
7. No haga bucles o enrolle los cables.
8. Instale la cubierta y/o cierre la puerta del equipo.

Installation

1. Couper toutes les alimentations de l'appareil avant d'y travailler.
2. Pour le montage voir la figure 1.
3. S'assurer que le SPD est de la valeur nominale convenant à votre système en comparant les mesures de tension à la tension de ligne (L-L, L-N) sur l'étiquette du produit.
4. S'assurer que les fils noirs sont raccordés aux fils de ligne et que le fil blanc est raccordé au fil du neutre (voir la figure 2).

   REMARQUE : Le modèle SDSA3650D en triangle (delta) n'inclut pas ou n'exige pas un fil blanc.
5. Torsader les conducteurs de 1/2 tour ou plus par 305 mm (12 po) de longueur.
6. Maintenir la longueur des conducteurs aussi courte que possible et sans courbures accentuées.
7. Ne pas faire de boucles et ne pas enrouler les fils.
8. Installer le couvercle ou fermer la porte de l'appareil.

Figure / Figura / Figure 1 : Mounting and Wiring / Montaje y alambrado / Montage et câblage

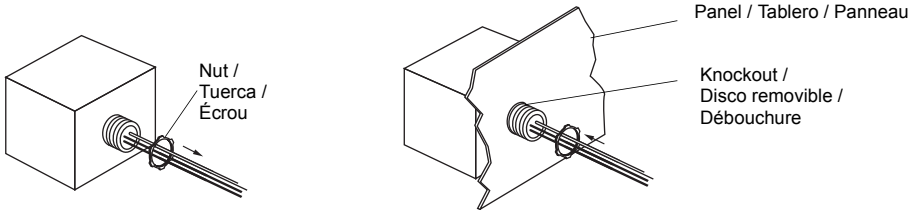
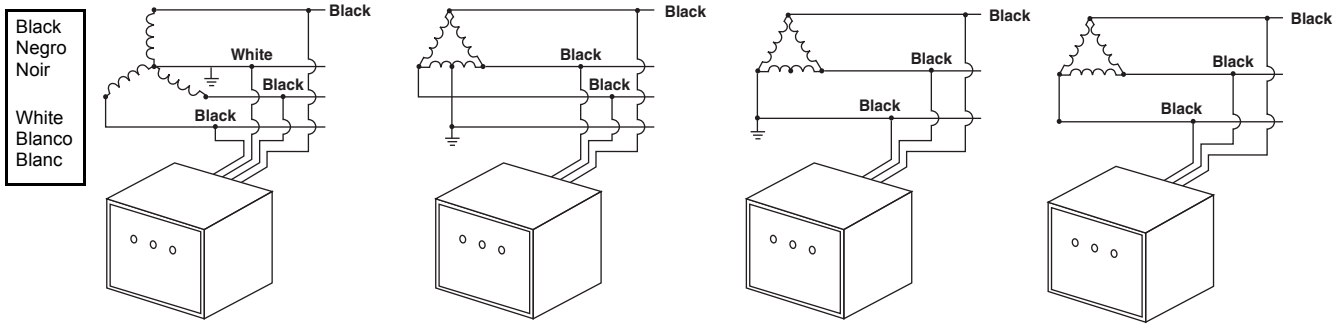


Figure / Figura / Figure 2 : Wiring / Alambrado / Câblage



3-phase 4-wire 208Y/120 Vac or 480Y/277 Vac or 600Y/347 Vac

3 fases, 4 hilos de 208Y/120 V~ (ca) o 480Y/277 V~ (ca) 600/347 V~ (ca)

Triphasé à 4-fils de 208Y/120 Vca ou 480Y/277 Vca, ou 600Y/347 Vca

3-phase 3-wire 240/120 Vac High-Leg Delta

3 fases, 3 hilos de 240/120 V~ (ca) extremo alto de una instalación en delta

Triphasé à 3-fils 240/120 Vca sommet du triangle

3-phase 3-wire (corner grounded) 240 Vac or 480 Vac or 600 Vac

3 fases, 3 hilos (puesto a tierra en esquina) de 240 V~ (ca) o 480 V~ (ca) 600 V~ (ca)

Triphasé à 3-fils (mis à la terre par le coin) 240 Vca ou 480 Vca ou 600 Vca

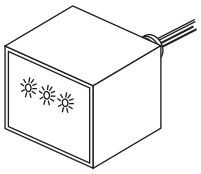
3-phase 3-wire (ungrounded) 240 Vac or 480 Vac or 600 Vac

3 fases, 3 hilos (sin conexión a tierra) de 240 V~ (ca) o 480 V~ (ca) 600 V~ (ca)

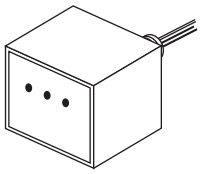
Triphasé à 3-fils (non mis à la terre) 240 Vca ou 480 Vca ou 600 Vca

For troubleshooting, call the Surgelogic Technical Assistance Group at 1-800-577-7353.

Figure / Figura / Figure 3 : Diagnostic Operation / Diagnóstico del funcionamiento del equipo / Diagnostic de fonctionnement



LED ON = OK /
LED ENCENDIDO = funcionamiento normal /
DÉL ALLUMÉE = OK



LED OFF = Fault /
LED APAGADO = falla /
DÉL ÉTEINTE = Défaut /

- **LED ON** = Normal Operation
- **LED OFF** = Check circuit breakers and connections. Verify line voltage at point of connection; if all correct, replace unit.

- **LED ENCENDIDO** = funcionamiento normal
- **LED APAGADO** = Revise los interruptores automáticos y las conexiones. Verifique la tensión de línea en el punto de conexión; si todo se encuentra en órden, sustituya el SPD.

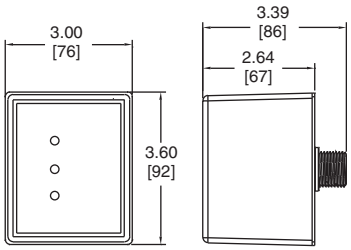
- **DÉL ALLUMÉE** = Fonctionnement normal
- **DÉL ÉTEINTE** = Vérifier les disjoncteurs et les raccordements. Vérifier la tension de ligne au point de raccordement; si tout est correct, remplacer le SPD.

Dimensions

Dimensiones

Dimensions

Figure / Figura / Figure 4 : Dimensions / Dimensiones / Dimensions



in. / pulg / po
[mm]

NOTE: Knockout trade size is 0.5 in. (13 mm). Actual hole size is 0.875 in. (22 mm).

NOTA: El tamaño estándar del disco desprendible es de 13 mm (0,5 pulg). El tamaño real del agujero es de 22 mm (0,875 pulg).

REMARQUE: La taille commerciale des débouchures est de 13 mm (0,5 po). Taille réelle du trou : 22 mm [0,875 po].

Schneider Electric USA, Inc.
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Salt Lake City, UT 84104 USA
1-888-SquareD (1-888-778-2733)
www.schneider-electric.us

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1-800-565-6699
www.schneider-electric.ca

For troubleshooting, call the Surgelogic Technical Assistance Group at 1-800-577-7353.

SECTION 4

LOOSE SHIP PARTS

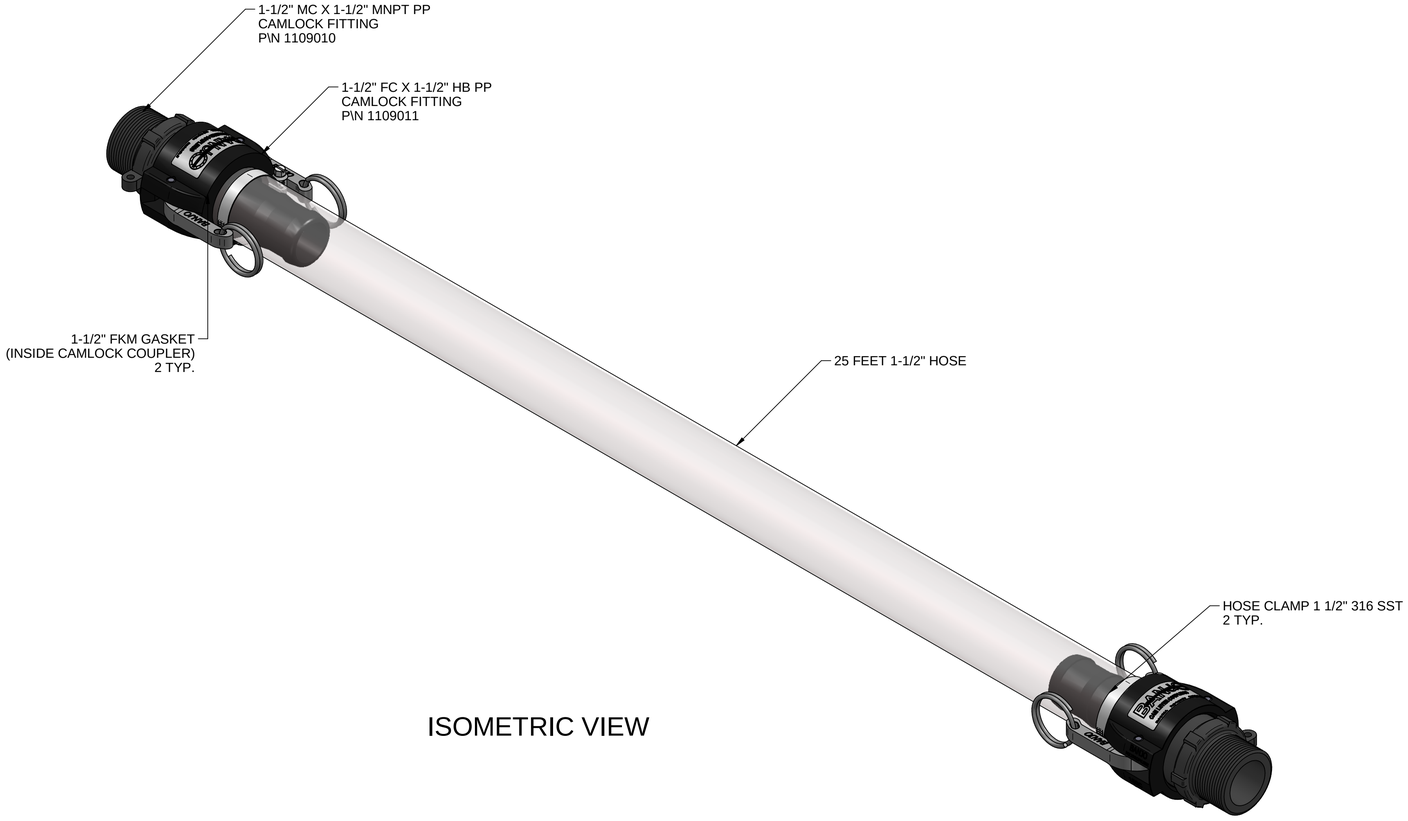
4.1

Parts Ship Loose w/ Skid

QTY	Description	Part #
1	Kuri-Tech Hose Assembly	3021800334-210
1	Motor Filling Items	
1	Davit Crane Assembly	
1	1” PVC Back Pressure Valve	Griffco Part # BPG100P
1	Cable Grip	1102478

DWG No
3021800334-210

REV
0



ISOMETRIC VIEW

PLAN VIEW

NOTES:

1. QUANTITY OF THE FOLLOWING TO BE SHIPPED LOOSE:

   (2) SPARE GASKETS, 100GV
   (1) 1" PVC/VITON CHECK VALVE W/ SPRING
   (1) 1-1/2" X 1" SCH. 80 PVDF TXT REDUCER BUSHING

REV	DATE	DESCRIPTION	BY	APPD	REVD
0	12/17/21	RELEASE FOR PRODUCTION	LJM		
A	10/29/21	FIRST ISSUE	LJM		

REVISIONS

CUSTOMER
HART ENGINEERING
(VEOLIA/TAUNTON WWTF - CHEMICAL INDUCTION MIXER)

JOB No 3021800334 | PURCHASE ORDER No 9900.109

TITLE
HOSE ASSEMBLY DRAWING

ENGINEERS SEAL

ProMinent®
THE PROMINENT GROUP OF COMPANIES

PITTSBURGH, PA USA WWW.PROMINENT.US

PROMINENT FLUID CONTROLS LTD.
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N1H 6J3
TEL. 519 836 5692 FAX. 519 836 5226

PROMINENT FLUID CONTROLS INC.
RIDC PARK WEST
136 INDUSTRY DRIVE,
PITTSBURGH P.A., USA. 15275
TEL. 412 787 2484 FAX. 412 787 0704

DESIGNED	LJM	APPROVED	SB
DRAWN	LJM	SCALE	N.T.S.
CHECKED	JDB	DATE	10/29/21

DWG No 3021800334-210 | REV 0 | PAGE 1/1

5PT5

COMMANDER
500

Like a favorite tool in your toolbox, Thern Commander Series portable davit cranes are ideal for many applications. Their sturdy design makes them both affordable and easy-to-use.

Model 5PT5-E2

650 lb (300kg) Portable Davit Cranes

- Rugged and Affordable
- Quick-Mount Winch Bracket
- 360° Rotation
- Manual or Power Winch Operation
- Five Corrosion-Resistant Finishes
- Easy, No-Tools Assembly/Disassembly
- Variety of Bases
- 2-Year Warranty

ISO 9001 : 2015 CERTIFIED

CE

Made In USA
Since 1948

Thern Winches & Cranes

Winona, MN USA | www.thern.com

CONFIGURATIONS

5PT5 SERIES - Portable Davit Crane

Model	Description	Weight lb	Weight kg
Popular Configurations			
5PT5-M1	up to 650 lb capacity with M4022PB-K spur gear hand winch - powder coat crane	102	46
5PT5G-M1	up to 650 lb capacity with M4022PB-K spur gear hand winch – galvanized crane	102	46
5PT5-M2	up to 650 lb capacity with 4WM2-K worm gear hand winch - powder coat crane	123	56
5PT5G-M2	up to 650 lb capacity with 4WM2-K worm gear hand winch - galvanized crane	123	56
5PT5S-M3	up to 650 lb capacity with M4042PBSS-K spur gear hand winch – stainless steel crane	110	50
5PT5-E2	up to 650 lb capacity with 4WP2-K electric winch - powder coat crane	158	72
Crane Only			
5PT5	up to 650 lb capacity - base model - powder coat finish	86	39
5PT5G	up to 650 lb capacity - base model - galvanized finish	86	39
5PT5S	up to 650 lb capacity - base model - 304 stainless steel finish	86	39
5PT5S316	up to 650 lb capacity - base model - 316 stainless steel finish	86	39
5PT5X	up to 650 lb capacity - base model - epoxy gray finish	86	39
Winch Only			
M1	M4022PB-K – spur gear hand winch only	16	8
M2	4WM2-K – worm gear hand winch only – powder coat	37	17
M2X	4WM2EGRA-K – worm gear hand winch only - epoxy gray	37	17
M3	M4042PBSS-K – spur gear hand winch only – stainless steel	24	11
E2	4WP2-K electric winch – 115/1/60 VAC with 6 ft pendant control – enamel	72	33
E2X	4WP2EGRA-K electric winch – 115/1/60 VAC with 6 ft pendant control – epoxy gray	72	33
E4	4777-K electric winch – 115/1/60 VAC with 6 ft pendant control – enamel	96	44
E4X	4777EGRA-K electric winch – 115/1/60 VAC with 6 ft pendant control – epoxy gray	96	44
E4DC	4777DC-K electric winch – 12 volt DC with 10 ft pendant control – enamel	114	52
E4DCX	4777DCEGRA-K electric winch – 12 volt DC with 10 ft pendant control – epoxy gray	114	52

INDEPENDENT BASES – sold separately

Pedestal, Socket (flush mount) or Wall mount style

Wheel Base for floor crane operation. Base includes stationary front wheels and rear locking caster wheels for 360° maneuverability. See Model 5BR5.

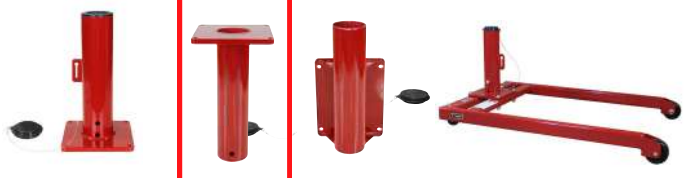
Important: Base installation is customer's responsibility. Thern recommends consulting a civil engineer or other qualified professional. Contact Thern for installation guidelines.

WIRE ROPE ASSEMBLIES – sold separately

~~Galvanized or~~ Stainless Steel wire rope assemblies with swivel hook and latch complete with swaged ball fitting to work with the quick disconnect anchor on the winch. 316 Stainless Steel assemblies available - contact factory.

Finishes	MODELS Pedestal	Flush	Wall	Wheel	Extension
Powder Coat	5BP5	5BF5	5BW5	5BR5	5BE5-15
Galvanized	5BP5G	5BF5G	5BW5G	-	5BE5-15G
304 Stainless Steel	5BP5S	5BF5S	5BW5S	-	5BE5-15S
316 Stainless Steel	5BP5S316	5BF5S316	5BW5S316	-	5BE5-15S316
Epoxy	5BP5X	5BF5X	5BW5X	5BR5X	5BE5-15X
Approximate Ship Weight	21 lbs (9.5 kg)	21 lbs (9.5 kg)	23 lbs (10.4 kg)	77 lbs (35 kg)	17 lbs (7.7 kg)

Wire Rope Length		Galvanized Aircraft Cable 3/16" Dia. (4.8 mm)	Galvanized Aircraft Cable 1/4" Dia. (6.4 mm)	~~304~~ Stainless Steel Wire Rope 3/16" Dia. (4.8 mm)	~~304~~ Stainless Steel Wire Rope 1/4" Dia. (6.4 mm)
(ft)	(m)	Model No.	Model No.	Model No.	Model No.
20	6.0	WA19-20NS	WA25-20NS	WS19-20NS	WS25-20NS
28	8.5	WA19-28NS	WA25-28NS	WS19-28NS	WS25-28NS
36	10.9	WA19-36NS	WA25-36NS	WS19-36NS	WS25-36NS
45	13.7	WA19-45NS	WA25-45NS	WS19-45NS	WS25-45NS
60	18.2	WA19-60NS	WA25-60NS	WS19-60NS	WS25-60NS
75	22.8	WA19-75NS	WA25-75NS	WS19-75NS	WS25-75NS
90	27.4	WA19-90NS	WA25-90NS	WS19-90NS	WS25-90NS



These products are not for lifting people, or things over people.

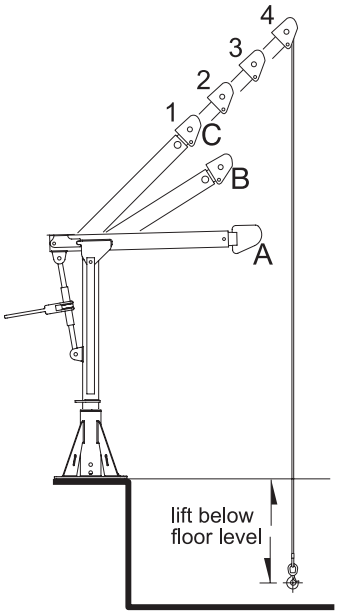
IMPORTANT It is the owner or operator's responsibility to determine the suitability of the equipment to its intended use. Study all applicable codes, manuals and regulations. Be sure to read the Owner's Manual supplied with the equipment before operating it.

PERFORMANCE

COMMANDER 500

Commander 500 Lift Below Floor [2] Level

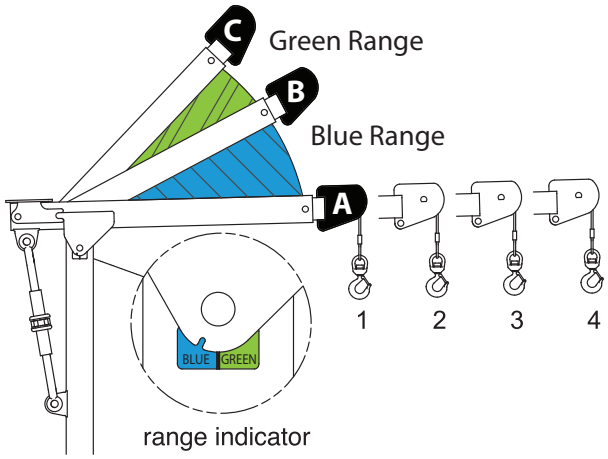
Lift Below [1] Floor				Wire Rope Diameteter		Wire Rope Length [3]		Winch Configurations				
Minimum (C4)		Maximum (C1)						M1	M2	M3	E2	E4
(ft)	(m)	(ft)	(m)	(in)	(mm)	(ft)	(m)					
2	0.6	7	2.1	3/16	5	20	6	x	-	x	-	x
10	3.0	15	4.5	3/16	5	28	8	x	-	x	-	x
18	5.4	23	7.0	3/16	5	36	10	x	-	x	-	x
27	8.2	32	9.7	3/16	5	45	13	x	-	x	-	x
42	12.8	47	14.3	3/16	5	60	18	-	-	x	-	x
57	17.3	62	18.8	3/16	5	75	22	-	-	x	-	x
72	21.9	77	23.4	3/16	5	90	27	-	-	x	-	x
2	0.6	7	2.1	1/4	6	20	6	-	x	x	x	x
10	3.0	15	4.5	1/4	6	28	8	-	x	x	x	x
18	5.4	23	7.0	1/4	6	36	10	-	x	x	x	x
27	8.2	32	9.7	1/4	6	45	13	-	x	x	x	x
42	12.8	47	14.3	1/4	6	60	18	-	x	x	x	x
57	17.3	62	18.8	1/4	6	75	22	-	x	-	x	x
72	21.9	77	23.4	1/4	6	90	27	-	-	-	-	x



[1] Lift below floor level varies depending on boom position and base configuration. For long lifts please contact factory.
[2] Performance Characteristics are for standard products referred to in this manual. Non-standard products may vary from the original design. Contact Thern, Inc. for this information.
[3] Wire rope assemblies include a hook and a swaged ball fitting to work with quick disconnect anchor on winches and 316SS wire rope is also available. Please contact the factory.

Commander 500 Performance Ratings[2]

	Boom Position	Load Rating (lb)	Load Rating (kg)
BLUE RANGE	A-1	550	250
	A-2	425	190
	A-3	350	160
	A-4	300	135
GREEN RANGE	B-1	650	300
	B-2	525	235
	B-3	425	190
	B-4	350	160
	C-1	650	300
	C-2	525	235
	C-3	425	190
	C-4	350	160



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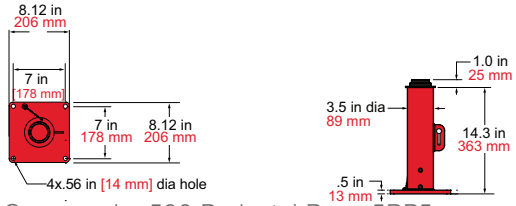
PERFORMANCE

COMMANDER 500

Commander 500 with Pedestal Base
Reach & Height Above Floor

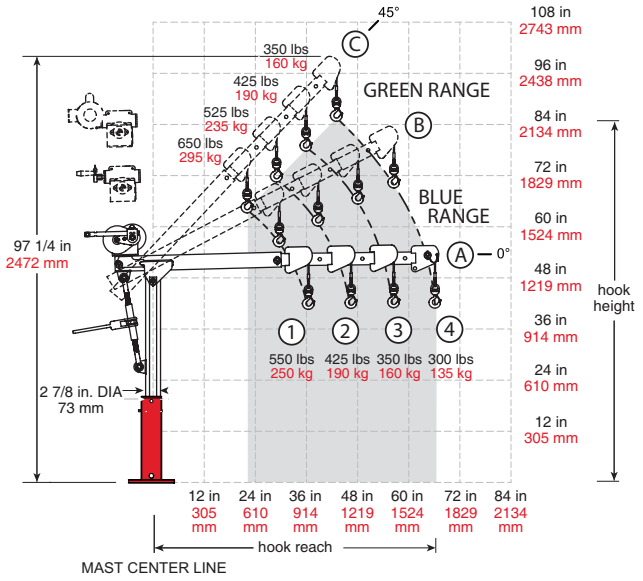
Boom Position	Hook Reach		Hook Height	
	(in)	(mm)	(in)	(mm)
A-1	36	914	42	1066
A-2	46	1168	42	1066
A-3	56	1422	42	1066
A-4	66	1676	42	1066
B-1	30	762	56	1422
B-2	38	965	60	1524
B-3	46	1168	65	1651
B-4	54	1371	69	1752
C-1	23	584	64	1625
C-2	29	736	71	1803
C-3	36	914	77	1955
C-4	42	1066	84	2133

Dimensions are for reference only and subject to change without notice.



Commander 500 Pedestal Base 5BP5

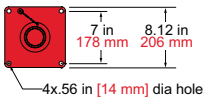
5BP5 5BP5S 5BP5X
5BP5G 5BP5S316

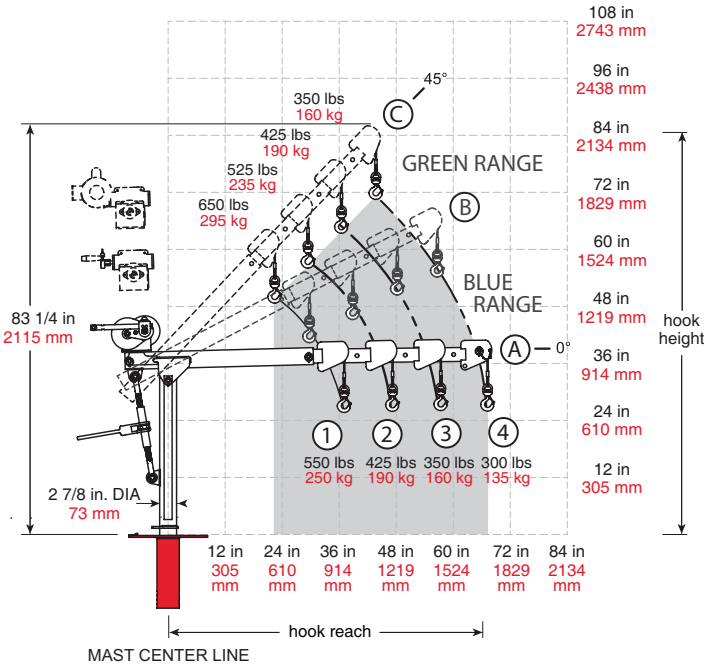


Commander 500 with Flush or Wall-Mount
Base - Reach & Height Above Floor

Boom Position	Hook Reach		Hook Height	
	(in)	(mm)	(in)	(mm)
A-1	36	914	28	711
A-2	46	1168	28	711
A-3	56	1422	28	711
A-4	66	1676	28	711
B-1	30	762	42	1066
B-2	38	965	46	1168
B-3	46	1168	51	1295
B-4	54	1371	55	1397
C-1	23	584	50	1270
C-2	29	736	57	1447
C-3	36	914	63	1600
C-4	42	1066	70	1778

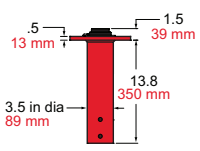
Dimensions are for reference only and subject to change without notice.





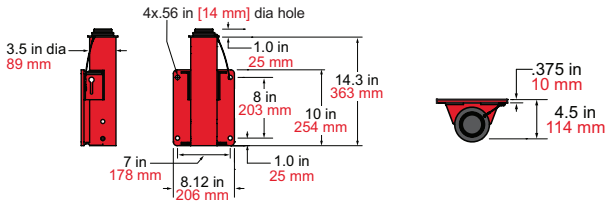
Commander 500
Flush Mount Base

5BF5
5BF5G
5BF5S
5BF5S316
5BF5X



Commander 500
Wall-Mount Base

5BW5
5BW5G
5BW5S
5BW5S316
5BW5X



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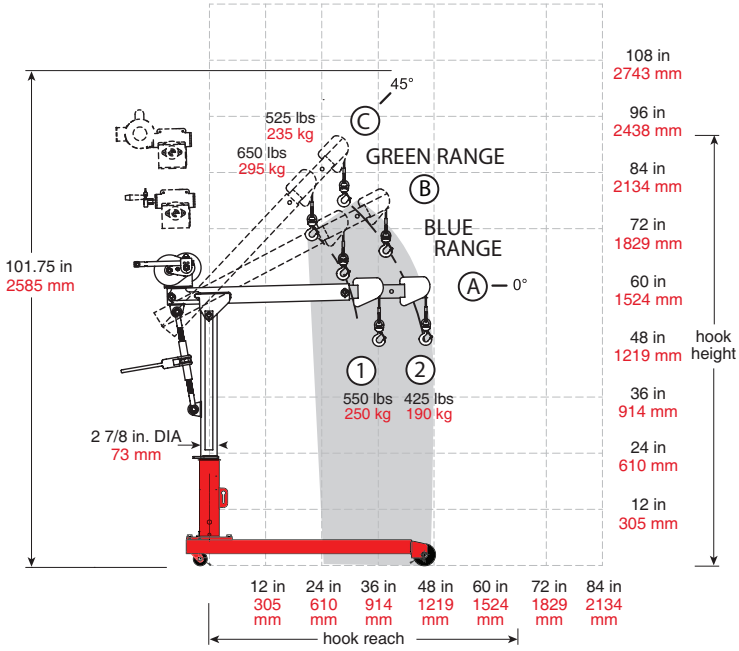
PERFORMANCE

COMMANDER 500

Commander 500 with Wheel Base

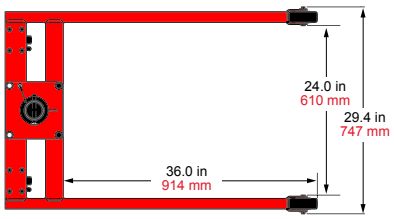
IMPORTANT:
Crane DOES NOT rotate when assembled in 5BR wheel base.



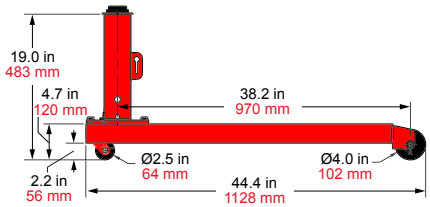
Commander 500 with Wheel Base
Reach & Height Above Floor

Boom Position	Hook Reach		Hook Height	
	(in)	(mm)	(in)	(mm)
A-1	36	914	46	1168
A-2	46	1168	46	1168
B-1	30	762	60	1524
B-2	38	965	64	1625
C-1	23	584	68	1727
C-2	29	736	75	1905

Dimensions are for reference only and subject to change without notice.



Commander 500 Wheel Base Load Ratings	
Boom Position 1	SEE LOAD RATING ON CRANE
Boom Position 2	
Boom Position 3	DO NOT USE
Boom Position 4	



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ACCESSORIES

Accessories for Commander 500

Item	Part Number	Description
Base Anchor Kit	AN50A-5 AN50A-5S AN50A-5S316	4 Hilti® Zinc Plated Steel fasteners 1/2 X 5.50 STL KB-TZ 4 Hilti® 304 Stainless Steel fasteners 1/2 X 5.50 SST304 KB-TZ 4 Hilti® 316 Stainless Steel fasteners 1/2 X 5.50 SST316 KB-TZ
Rotational Lock	5PT5LCK	5PT5 Series Rotational Lock Holds crane position at 30° increments. 316 Stainless Steel
Drill-Drive Kit	ED330-DW11	120 VAC, 11 amp, 330rpm drill-motor to power drive the hand winch. Only available for cranes configured with the M2 winch option. Includes 1-1/8" hex drive socket.
	ED300-DW06	Cordless drill kit, 60 V Brushless Motor, 300rpm drill-motor to power drive the M2 hand winch option. Includes 1-1/8" hex drive socket.
	ED400-DW09	Heavy Duty Cordless drill kit, 60 V Brushless Motor, 400rpm drill-motor to power drive the M2 hand winch option. Includes 1-1/8" hex drive socket.
Headache Ball	HB10-12-25	Red Painted 10lb fits 1/8" to 1/4" Rope
	HB10S-12-25	Stainless Steel 10lb fits 1/8" to 1/4" Rope
Cable Spooler	RW50	316 stainless steel reel winds up wire rope when detached from crane.
Wire Rope Keeper	RK19-25S	304 Stainless steel bracket attaches to base or other structure to hold free end of the wire rope when detached from the crane.
	RK19-25S316	316 Stainless steel bracket attaches to base or other structure to hold free end of the wire rope when detached from the crane.
Limit Switch	5PT5LS-EL	Limit Switch Kit for the 5PT5

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OPTIONS AND CUSTOMIZATION

Options

Thern offers a variety of additional options you can choose to enhance your davit crane.

- FACTORY LOAD TEST
  Upon request, Thern can test your crane prior to shipping, up to 125% of rated load.
- EXTENDED WARRANTY
  Extend our standard 2-year warranty.
- PE STAMP - PROFESSIONAL ENGINEER STAMP
  Available upon request at time of order.
- CE MARK
  Available upon request at time of order, CE mark for products sold into the European Union.
- ATEX CLASSIFICATION
  Contact factory
- POWER WINCH OPERATION
  AC electric in any voltage. DC electric, hydrualic and pneumatic power winches available.
- CUSTOM ELECTRIC CONTROLS
  Thern can build the high quality controls you need to operate your equipment.
- DRILL-DRIVEABLE WINCH
  A worm gear hand winch is also available for operation with a 400 rpm max drill motor option.

Customization

Customization is available for almost all Thern products and should always be performed by our engineers to assure the changes meet our stringent quality standards. Below are some of our more common customization requests. Only factory modifications are covered under warranty.

- LONGER LIFT DISTANCES
  Customized winch and crane configurations to accommodate longer lifts.
- CUSTOM COLORS & FINISHES
  Custom colors and finishes are available to match your unique application
- EXTENDED BOOM AND MASTS
  Thern can extend mast heights and boom lengths to fit your needs
- RELOCATE THE WINCH
  The winch can be relocated to fit confined spaces or height restrictions
- SPECIAL BASES
  Custom bases or mounting requirements can be manufactured to meet your unique situation

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Quality Winches, Cranes and Hoists
Since 1948

MADE IN USA

Thern, Incorporated
World Headquarters
5712 Industrial Park Road Winona, MN USA
Toll Free: 1-800-843-7648
Phone: 1-507-454-2996
www.thern.com

Thern Europe
Bedrijvenpark Twente 454e
7602 KM Almelo The Netherlands
Phone: +31-546-898-380
europe@thern.com

Thern
Winches & Cranes

5PT5CS-0620

Thern
Winches & Cranes

Read this Owner's Manual thoroughly before operating the equipment. Keep it with the equipment at all times. Replacements are available from Thern, Inc., PO Box 347, Winona, MN 55987, 507-454-2996. www.thern.com

IMPORTANT: Please record product information on page 2. This information is required when calling the factory for service.

ORIGINAL TEXT

COMMANDER
Owner's Manual

For
5PT5, 5PT10 and 5PT20 Series
5PTC10 and 5PTC20 Series
Portable Davit Cranes

A12376-I-1119

Two-Year Limited Warranty

Please record the following:

Date Purchased:

Crane Model No.:

Crane Serial No.:

If sold with a winch:

Winch Model No.:

Winch Serial No.:

This information is required when calling the factory for service.

Thern, Inc. warrants its products against defects in material or workmanship for two years from the date of purchase by the original using buyer, or if this date cannot be established, the date the product was sold by Thern, Inc. to the dealer. To make a claim under this warranty, contact the factory for an RGA number. The product must be returned, prepaid, directly to Thern, Inc., 5712 Industrial Park Road, Winona, Minnesota 55987. The following information must accompany the product: the RGA number, the date of purchase, the description of the claimed defect, and a complete explanation of the circumstances involved. If the product is found to be defective, it will be repaired or replaced free of charge, and Thern, Inc. will reimburse the shipping cost within the contiguous USA.

This warranty does not cover any damage due to accident, misuse, abuse, or negligence. Any alteration, repair or modification of the product outside the Thern, Inc. factory shall void this warranty. This warranty does not cover any costs for removal of our product, downtime, or any other incidental or consequential costs or damages resulting from the claimed defects. This warranty does not cover brake discs, wire rope or other wear components, as their life is subject to use conditions which vary between applications.

FACTORY AUTHORIZED REPAIR OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE EXCLUSIVE REMEDY TO THE CONSUMER. THERN, INC. SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR BREACH OF ANY EXPRESS OR IMPLIED WARRANTY ON THIS PRODUCT. EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ON THIS PRODUCT IS LIMITED IN DURATION TO THE DURATION OF THIS WARRANTY.

Some states do not allow the exclusion or limitation of incidental or consequential damages, or allow limitations on how long an implied warranty lasts, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Note: Thern, Inc. reserves the right to change the design or discontinue the production of any product without prior notice.

About This Manual

The Occupational Safety and Health Act of 1970 states that it is the employer's responsibility to provide a workplace free of hazard. To this end, all equipment should be installed, operated, and maintained in compliance with applicable trade, industrial, federal, state, and local regulations. It is the equipment owner's responsibility to obtain copies of these regulations and to determine the suitability of the equipment to its intended use.

This Owner's Manual, and warning labels attached to the equipment, are to serve as guidelines for hazard-free installation, operation, and maintenance. They should not be understood to prepare you for every possible situation.

The information contained in this manual is applicable only to the Thern Commander Series Model 5PT5 and 5PT10/5PTC10 and 5PT20/5PTC20 Portable Davit Cranes. Do not use this manual as a source of information for any other equipment.

The following symbols are used for emphasis throughout this manual:

⚠WARNING

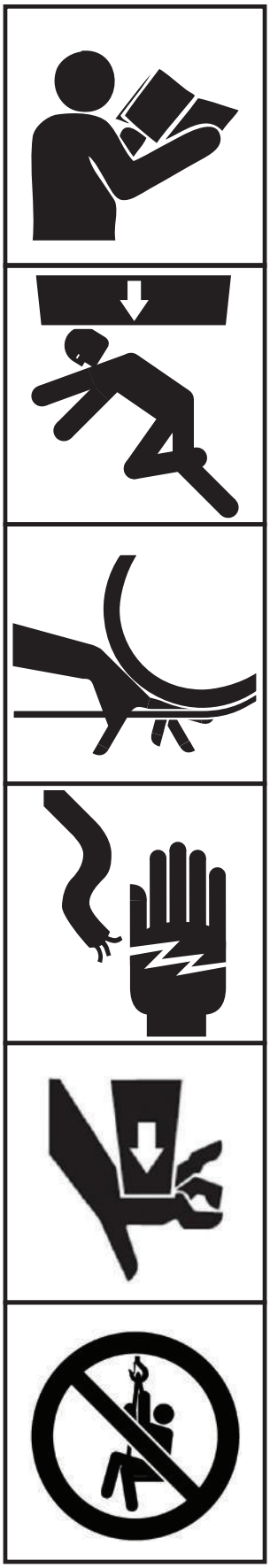
Failure to follow 'WARNING!' instructions may result in equipment damage, property damage, and/or serious personal injury.

⚠CAUTION

Failure to follow 'CAUTION!' instructions may result in equipment damage, property damage, and/or minor personal injury.

Important!

Failure to follow 'important!' instructions may result in poor performance of the equipment.



Suggestions for Safe Operation

⚠WARNING

DO the following:

Read and comply with the guidelines set forth in this Owner's Manual. Keep this manual, and all labels attached to the crane, readable and with the equipment at all times. Contact Thern, Inc. for replacements.

Check lubrication before use.

Install the wire rope securely to the winch drum.

Keep at least 4 wraps of wire rope wound on the drum at all times, to serve as anchor wraps. With less than 4 wraps on the drum the wire rope could come loose, causing the load to escape.

Keep hands away from sheaves, gears, wire rope, and other moving parts.

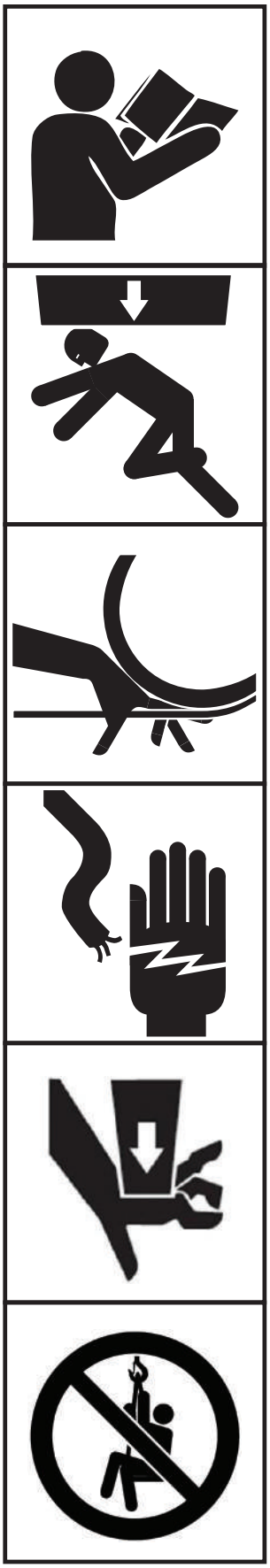
Disconnect electric power before servicing the equipment.

Keep all unnecessary personnel away from crane while in operation.

Keep out of the path of the load, and out of the path of a broken wire rope that might snap back and cause injury.

When operating the ratchet jack, avoid fully un-threading. Test the travel limits of the ratchet jack before assembly to the crane and before loading, to verify it does not fully un-thread. Contact Thern if it does fully un-thread.

Ensure that both threaded ends of the ratchet jack are threaded an equal distance out of the jack when assembled to the crane. If threaded ends are not equal, the crane boom will not be able to operate in its full range of motion, and equipment damage could occur.



Suggestions for Safe Operation (cont.)

DO NOT do the following:

Do not lift people, or things over people. Do not walk or work under a load or in the line of force of any load.

Do not exceed the load rating of the crane or any other component in the system. To do so could result in failure of the equipment.

Do not use more than one crane to move a load that exceeds the load rating of a single crane. A shift in load weight could overload the equipment.

Do not use damaged or malfunctioning equipment. To do so could result in failure of the equipment.

Do not modify the equipment in any way. To do so could cause equipment failure.

Do not wrap the wire rope around the load. This damages the wire rope and could cause the load to escape. Use a sling or other approved lifting device.

Do not operate the crane with guards removed or improperly installed.

Do not divert your attention from the operation. Stay alert to the possibility of accidents, and try to prevent them from happening.

Do not jerk or swing the load. Avoid shock loads by starting and stopping the load smoothly. Shock loads overload the equipment and may cause damage.

Do not use the crane and winch components for any use other than for their original intended function.

Do not use the crane to drag or pull loads. This will create side pulls, which could damage the equipment or cause the load to tip.

Do not leave a suspended load unattended. Place the load on the ground if it must be left unattended.

Do not adjust the winch brake with the load suspended.

Do not operate or apply loads without all pins securely in place.

Do not adjust the boom extension while the crane is loaded.

Do not make adjustments to the ratchet jack while the crane is loaded. To do so may require the use of excessive force which could allow the operator to shear the travel limit pin and cause damage or injury.

Do not force the ratchet handle past travel limits. This could sheer the travel limit pin and cause damage or injury.

Do not adjust the ratchet jack with the use of a ratchet handle extension. To do so could allow the elevator to shear the travel limit pin and cause damage or injury.

1.1 Installing the Crane

Important!

- A qualified professional should inspect or design the foundation to insure that it will provide adequate support.
- Locate the crane so it will be visible during the entire operation.

⚠WARNING

Do not install the crane in an area defined as hazardous by the National Electric Code, unless installation in such an area has been thoroughly approved.

Do not install the crane near corrosive chemicals, flammable materials, explosives, or other elements that may damage the crane or injure the operator. Adequately protect the crane and the operator from such elements.

Position the crane so the operator can stand clear of the load, and out of the path of a broken wire rope that could snap back and cause injury.

Attach the crane to a rigid and level foundation that will support the crane and its load under all load conditions, including shock loading.

1.1.1 CONSULT APPLICABLE CODES AND REGULATIONS for specific rules on installing the equipment.

1.1.2 LOCATE THE CRANE in an area clear of traffic and obstacles that could interfere with operation. Make sure the crane is accessible for maintenance and operation.

1.1.3 INSTALL THE CRANE on a level surface. **An uneven surface may cause the boom to rotate in the direction the mast is leaning.**

1.1.4 FASTEN THE BASE securely to the foundation to withstand applicable overturning moments and mounting bolt reaction. See Table 1.

a FOR STANDARD PRODUCTS referred to in this manual, use 5/8-inch coarse thread fasteners, grade 5 or better. Recommended torque for Grade 5 bolts without lubrication is 150 ft-lb.

Refer to manufacturer's instructions for other fastener types with specific torque or installation instructions.

b NON-STANDARD PRODUCTS that vary from the original design may have different fastening requirements. Contact a structural engineer or Thern, Inc. for this information.

TO COMPLY WITH LOCAL CODES, CONTACT A QUALIFIED PROFESSIONAL TO OBTAIN PROPER STRUCTURE OR FOUNDATION SPECIFICATIONS FOR THE MOUNTING OF THERN PRODUCTS.

Table 1 - Crane Reactions[2]

				Pedestal Base		Wall Mount Base			
Crane Model	Mast Moment		Suggested Bolt Size	Axial Force per Bolt[1]		Axial Force per Bolt[1]		Shear Force per Bolt	
5PT5	20,690 in-lbs	2,338 N-m	1/2 inch (M12)	2,000 lbs	8,897 N	1,390 lbs	6,184 N	1,080 lbs	4,805 N
5PT10	37,790 in-lbs	4,270 N-m	5/8 inch (M16)	1,680 lbs	7,474 N	1,420 lbs	6,317 N	1,120 lbs	4,983 N
5PT20	95,110 in-lbs	10,747 N-m	5/8 inch (M16)	4,240 lbs	18,862 N	3,560 lbs	15,837 N	2,740 lbs	12,189 N
5PTC10	37,790 in-lbs	4,270 N-m	5/8 inch (M16)	1,680 lbs	7,474 N	1,420 lbs	6,317 N	1,120 lbs	4,983 N
5PTC20	93,800 in-lbs	10,599 N-m	5/8 inch (M16)	4,250 lbs	18,906 N	3,430 lbs	15,259 N	2,540 lbs	11,299 N

1 Force in tension.

2 This information may change without prior notice. It is the responsibility of the installer and/or end user to ensure the most current information is used.

1.2 Assembling the Crane

Important!

- Inspect the crane during assembly according to the Instructions for Periodic Inspection. This will give you a record of the condition of the crane with which to compare future inspections.
- Save all boxes and crates that the crane was shipped in, use them again if you need to repackage the crane.
- Contact the factory immediately if any parts are missing or damaged.
- Do not overtighten fasteners, this may strip threads or cause damage to other parts.

⚠CAUTION

When installing the ratchet jack, support the end of the boom so the boom does not fall and the ratchet jack does not swing up causing damage or injury.

When installing the boom extension, hold the boom extension securely so it does not slide abruptly in or out of the boom causing damage or injury.

1.2.1 STUDY PARTS DRAWINGS to understand how the crane is assembled. See pages 20-25.

1.2.2 LUBRICATE PINS and other components prior to assembly. See Section 3.2 - Lubricating the Crane.

1.2.3 INSTALL THE BASE. See Section 1.1 for additional information and crane overturning moments and mounting bolt reaction forces.

1.2.4 INSTALL THE FLANGE BEARING in the base. Bearing must be set level on the base.

1.2.5 ASSEMBLE THE CRANE in the following order.

a FASTEN THE WINCH to the mounting plate using the fasteners provided. On some models you will need to use an additional winch adapter plate and fasteners provided to fasten the winch to the crane. **Make sure the winch is positioned correctly with the winch drum facing toward the load. See Figure 3.**

b INSTALL THE MAST in the base. Move the mast side-to-side to make sure the bottom of the mast properly seats on the pin in the bottom of the base. **The crane will not be stable unless properly seated. See Figure 2.**

c FASTEN THE BOOM to the mast using the clevis pin and lynch pin provided. **Make sure the boom is positioned correctly, with the carrying handles located on the same side as the handles on the mast.**

d INSTALL THE HANDLE using the mast clevis pin and lynch pin provided.

e BEFORE INSTALLING THE RATCHET JACK Ensure that both threaded ends of the ratchet jack are threaded an equal distance out of the jack when assembled to the crane. If threaded ends are not equal, the crane boom will not be able to operate in its full range of motion, and equipment damage could occur.

Figure 1 – Crane Packaging

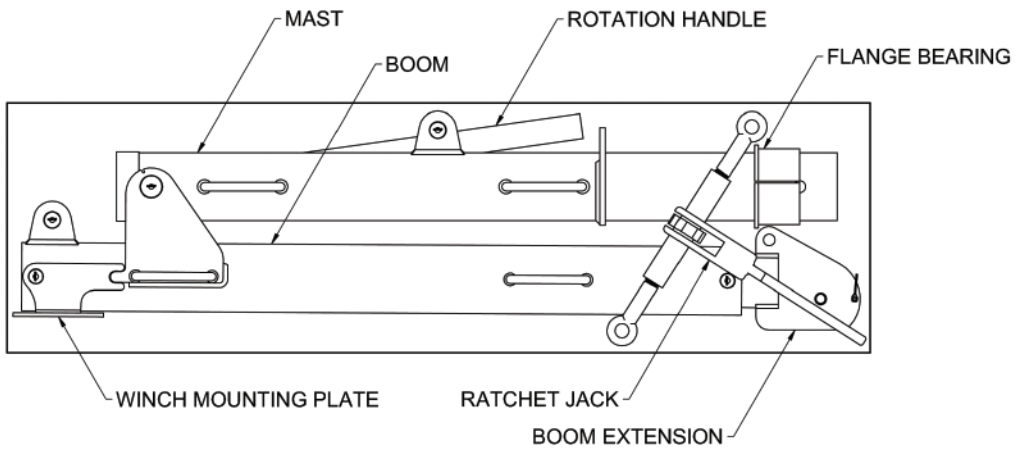


Figure 2 – Assembly Steps

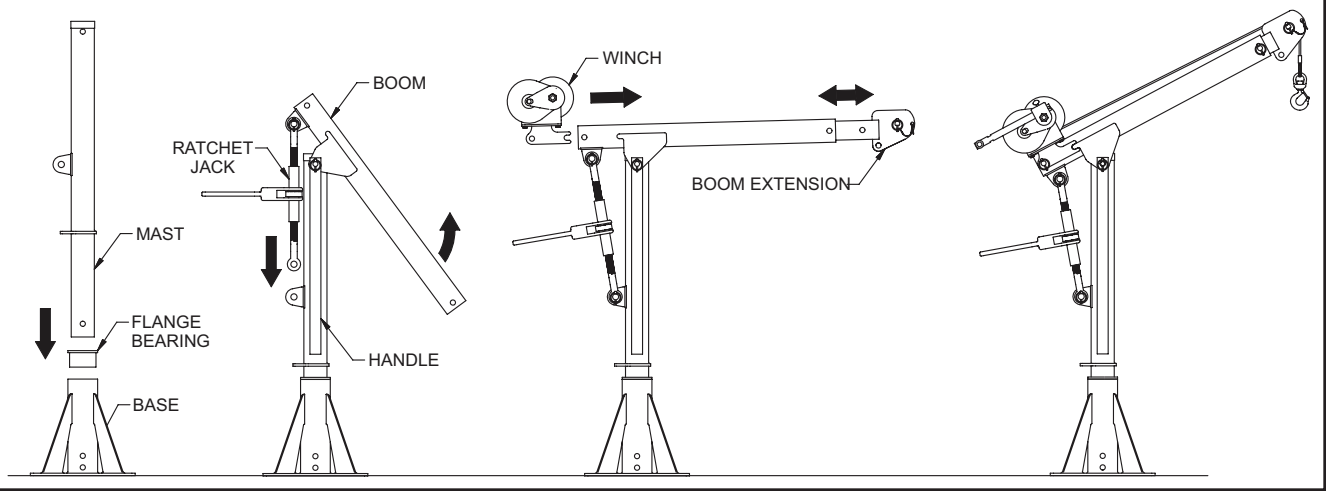


Figure 3 – Winch Mounting

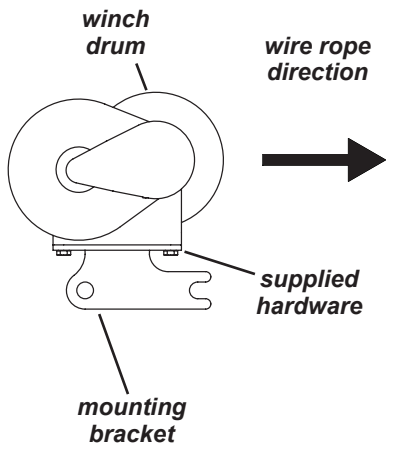
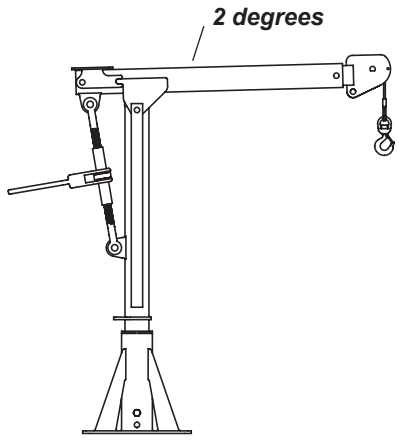


Figure 4 – Lowest Boom Angle



f INSTALL THE RATCHET JACK by fastening one end of the ratchet jack to the mounting ear on the boom with the clevis and lynch pin provided. Carefully pivot the boom up until the other end of the ratchet jack aligns with the mounting ear on the mast, and secure the ratchet jack to the mast using the clevis pin and lynch pin provided.

g ADJUST THE BOOM with the ratchet jack so the boom is slightly above the lowest boom angle. See Figure 4. **Do not lower boom below the lowest point, or the boom could fall and may result in the load escaping.**

h SLIDE THE BOOM EXTENSION into the boom, and secure in place with the clevis pin and lynch pin provided. **Make sure the boom extension is positioned correctly. See Figure 2.**

i INSTALL THE WINCH onto the boom. Slide into position and secure with provided clevis pin and lynch pin.

1.2.6 INSTALL THE WINCH HANDLE on hand winches, or connect electric current on power winches. Refer to instructions in the Winch Owner's Manual.

1.2.7 INSTALL THE WIRE ROPE. **Use wire rope assemblies in the length specified on page 26-28.**

a REMOVE ROPE KEEPER PIN at the sheave to allow rope to be installed.

b PASS THE WIRE ROPE over the sheave at the end of the boom.

c REINSTALL ROPE KEEP PIN to prevent the rope from escaping the sheave rope groove.

d ANCHOR THE WIRE ROPE to the winch drum and wind 4 wraps of wire rope onto the drum to act as anchor wraps. Refer to the instructions in the Winch Owner's Manual.

1.2.8 MAKE SURE ALL CLEVIS PINS ARE PROPERLY INSTALLED with all lynch pins in place to prevent components from shifting during use.

1.2.9 ADJUST BOOM ANGLE for the desired position using the ratchet-jack (if equipped). See Figure 2.

1.2.10 INSTALL UPPER TRAVEL LIMIT SWITCH when supplied with power winches as directed in supplemental instructions provided with limit switch kit.

2.1 General Theory of Operation

Important!

- Limit nonuniform winding by keeping tension on the wire rope.
- It is your responsibility to detect and account for different factors affecting the condition and performance of the equipment.

2.1.1 THE INTENDED USE of this machinery is to lift and lower loads of its rated capacity or less. It is not for lifting people or things over people.

2.1.2 THE FORCE REQUIRED to lift the load must not exceed the load rating of the crane. Consider the total force required to lift the load, not the weight of the load.

2.1.3 THIS EQUIPMENT CAN develop forces that will exceed the load rating. It is the responsibility of the equipment user to limit the size of the load. Inspect the equipment regularly for damage according to the instructions contained in this manual.

2.1.4 PERFORMANCE RATINGS of the equipment are affected by the position of the boom, the amount of wire rope you use and whether you use a single or two part line. **Crane load ratings decrease as you extend the reach.** See the Performance Characteristics Tables on page 26-28.

a LOAD RATING represents the maximum force that can be placed on new equipment.

b LIFT varies with the position of the boom, the length of the wire rope, and the rigging configuration (single or two part line).

c REACH varies with the position of the boom.

2.1.5 DUTY RATINGS refer to the type of use the equipment is subject to. Consider the following when determining duty rating.

a ENVIRONMENT: harsh environments include hot, cold, dirty, wet, corrosive, or explosive surroundings. **Protect the equipment from harsh environments when possible.**

b MAINTENANCE: poor maintenance, meaning poor cleaning, lubrication, or inspection, leads to poor operation and possible damage of the equipment. **Minimize poor maintenance by carefully following the instructions contained in this manual.**

c LOADING: severe loading includes shock loading and lifting loads that exceed the load rating of the equipment. **Avoid shock loads, and do not exceed the load rating of the equipment.**

d FREQUENCY OF OPERATION: frequent or lengthy operations increase wear and shorten the life span of gears, bearings, sheaves, and other components. **Increase maintenance of the equipment if used in frequent operations.**

2.1.6 AIRBORNE NOISE EMISSIONS vary depending on load and the type of winch being used. Standard configurations do not typically exceed a sound pressure level of 80dB(A) at workstations.

2.1.7 VIBRATION LEVELS vary depending on load and type of winch being used. Standard configurations do not typically exceed vibration levels of 2.5 m/s^2.

CONTACT THE FACTORY FOR MORE INFORMATION.

2.2 Preparing for Operation

Important!

- When determining whether the load will exceed the load rating, consider the total force required to move the load.

⚠WARNING

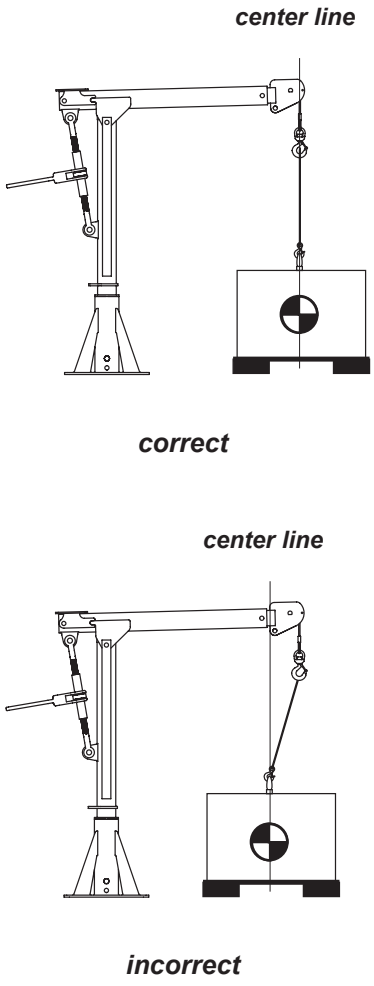
When operating the ratchet jack, avoid fully un-threading. Test the travel limits of the ratchet jack before assembly to the crane and before loading, to verify it does not fully un-thread. Contact Thern if it does fully un-thread.

Do not force the ratchet handle past travel limits. This could shear the travel limit pin and cause damage or injury.

⚠CAUTION

When adjusting boom length, set the boom angle just above the lowest angle and hold the boom extension securely so it does not slide abruptly in or out of the boom causing damage or injury.

Figure 5 – Positioning the Boom



2.2.1 CONSIDER THE OPERATION. Do not begin until you are sure you can perform the entire operation without hazard.

2.2.2 INSPECT ALL COMPONENTS of the system.

a INSPECT THE CRANE and other equipment according to the Instructions for Frequent Inspection.

b INSPECT THE WINCH according to the instructions in the Winch Owner's Manual.

c OPERATORS must be in good health, alert, thoroughly trained in operating the equipment, and properly clothed (hard hat, safety shoes and safety glasses, no loose clothing).

d THE LOAD must be clear of other objects and free to move. Make sure the load will not tip, spin, roll away, or in any way move uncontrollably.

2.2.3 KNOW YOUR LOAD and make sure you do not exceed the load rating of the crane or any other equipment in the system.

2.2.4 POSITION THE BOOM so the load hook is centered over the load. **Avoid side pulls which could damage the crane or cause the load to tip. See Figure 5.**

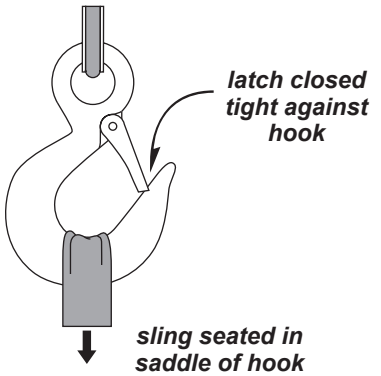
a ADJUST BOOM LENGTH by moving the boom extension in or out. **Do not make adjustments while the crane is loaded. The load rating decreases as you increase boom length. See the Performance Characteristics Tables page 26-28.**

b ADJUST BOOM ANGLE by operating the ratchet jack to raise or lower the boom. **The lift height below base level decreases as you raise the boom. See the Performance Characteristics Tables page 26-28.**

2.2.5 CONFIGURE THE CRANE for single part or two-part line operation. **Load ratings may increase with two-part line, lift height below base level will decrease with two part line. See the Performance Characteristics Tables on page 28.** Study parts drawing on page 25.

2.3 Attaching the Load

Figure 6 – Attaching Load



⚠WARNING

Do not wrap the wire rope around the load. This damages the wire rope and could cause the load to escape. Use a sling or other approved lifting device.

2.3.1 CLEAR OBJECTS from the path of the load so you can move it freely and observe it at all times during the operation.

2.3.2 MAKE SURE THE WIRE ROPE is not twisted. A twisted wire rope could cause the load to spin when it is raised off the ground.

2.3.3 ATTACH THE LOAD using a nylon sling, or other approved lifting device. Follow the recommendations of the sling manufacturer.

a SEAT THE SLING in the saddle of the hook with the hook latch completely closed. See Figure 6.

b CENTER THE LOAD on the hook so it will remain balanced and not tip or rotate to one side.

2.4 Moving the Load

Important!

- Obey a stop signal from anyone.
- Maintain tension on the wire rope to keep it tightly and evenly wound on the drum.
- If the crane and load are not visible during the entire operation, get help from another person.
- Appoint a supervisor if more than one person is involved in the operation. This will reduce confusion and increase safety.
- When lifting a load, use a tag line to keep the load from swinging or twisting, while keeping yourself away from the load.

⚠WARNING

When operating the ratchet jack, avoid fully un-threading. Test the travel limits of the ratchet jack before assembly to the crane and before loading, to verify it does not fully un-thread. Contact Thern if it does fully un-thread.

Do not force the ratchet handle past travel limits. This could shear the travel limit pin and cause damage or injury.

2.4.1 MOVE THE LOAD slowly and smoothly, only a small distance at first. Make sure the load is balanced and securely attached before continuing.

2.4.2 OPERATE THE WINCH to raise or lower the load. Refer to the instructions in the Winch Owner's Manual**.**

2.4.3 OBSERVE THE WIRE ROPE as it winds onto the drum. If it becomes loose, uneven, or overlapped, stop the operation and rewind the wire rope before continuing. **Continued operation with overlapped or uneven wire rope can damage the wire rope and shorten its life.**

2.4.4 OPERATE THE RATCHET JACK if necessary, to adjust the angle of the boom to keep the sheave centered over the load.

2.4.5 ROTATE THE BOOM to move the load side-to-side.

a ROTATE THE BOOM slowly and smoothly to avoid swinging the load or causing shock loads. **Do not jam the boom against other objects.**

b USE THE HANDLE to rotate the boom. **Do not push or pull the load or the wire rope to rotate the boom.**

3.1 Cleaning the Crane

Important!

Increase the frequency of maintenance procedures if the crane is:

- Operated for long periods.
- Used to lift heavy loads.
- Operated in wet, dirty, hot, or cold surroundings.

Clean the crane to remove dirt and help prevent rust and corrosion.

3.1.1 CLEAN THE CRANE every six months or whenever it is dirty.

a WIPE ALL EQUIPMENT to remove dirt and grease.

b LEAVE A LIGHT FILM of oil on all surfaces to protect against rust and corrosion.

c WIPE OFF excessive amounts of oil to avoid the accumulation of dirt.

3.1.2 REMOVE UNNECESSARY OBJECTS from the area surrounding the crane.

3.2 Lubricating the Crane

Important!

- Make sure lubricant has a temperature rating appropriate for the ambient temperatures of the operation.

Lubricate the crane properly to help protect it from wear and rust. Read the following instructions carefully.

3.2.1 LUBRICATE ALL PINS before installation and at least every 3 months. Use a grease brush to apply a light film of NLGI #2 grease to all pins.

3.2.2 LUBRICATE THE BASE PIN located on the bottom of the base before installation and at least every 3 months. Use a grease brush to apply a film of NLGI #2 grease to the pin.

3.2.3 LUBRICATE THE MAST BEARING located on top of the base before installation and at least every 3 months. Use a grease gun to apply NLGI #2 grease to the outside surfaces (between bearing and base).

3.2.4 LUBRICATE THE RATCHET JACK before installation and at least every 3 months. Use a grease gun to apply NLGI #2 grease to the grease fittings on the ratchet jack until excess grease can be seen. Wipe away any excess lubricant.

3.2.5 LUBRICATE THE WINCH. Refer to the Winch Owner's Manual for instructions.

3.2.6 LUBRICATE THE WIRE ROPE and other equipment by following the manufacturer's recommendations.

3.3 Disassembling the Crane

⚠CAUTION

When removing the boom extension, hold the boom extension securely so it does not slide abruptly in or out of the boom causing damage or injury.

When removing the ratchet jack, support the end of the boom so the boom does not fall and the ratchet jack does not swing up causing damage or injury.

3.3.1 STUDY PARTS DRAWINGS to understand how the crane is assembled. See pages 20-25.

3.3.2 REMOVE ANY ATTACHED LOAD from the wire rope.

3.3.3 REMOVE THE WIRE ROPE

a REMOVE THE ROPE KEEPER PIN located at the end of the boom.

b UNWIND THE ROPE from the winch drum and release the anchor.

c REPLACE THE ROPE KEEPER PIN

3.3.4 REMOVE THE WINCH HANDLE on hand winches, or disconnect electric current on power winches. Refer to instructions in the Winch Owner's Manual.

3.3.5 REMOVE THE WINCH and mounting bracket from the boom. Replace the clevis pin to prevent loss.

3.3.6 REMOVE THE BOOM EXTENSION.

a ADJUST THE BOOM ANGLE using the ratchet jack, so the boom is just slightly above horizontal.

b SECURE THE BOOM EXTENSION then remove the lynch pin and clevis pin securing the boom extension to the boom.

c CAREFULLY PULL THE BOOM EXTENSION out of the boom, then reinstall the clevis pin and lynch pin in the boom.

3.3.7 REMOVE THE RATCHET JACK.

a SECURE THE BOOM to prevent it from falling when the ratchet jack is released.

b DISCONNECT THE RATCHET JACK at the mast (bottom) by removing the lynch pin and clevis pin and slowly lower the boom until it is resting against the mast. Be careful that the ratchet jack does not swing up and cause injury.

c REMOVE THE PIN AT THE BOOM (top) to disconnect the ratchet jack from the crane. Hold onto the ratchet jack to prevent it from falling away.

d RECONNECT the clevis pins to the boom and mast with the appropriate lynch pins.

3.3.8 REMOVE THE ROTATION HANDLE from the mast.

3.3.9 DISCONNECT THE BOOM from the mast.

a SECURE THE BOOM to prevent it from falling away when the pins are removed.

b REMOVE THE LYNCH PIN AND CLEVIS PIN and carefully remove the boom.

c REPLACE the clevis pin and lynch pin in the mast.

3.3.10 REMOVE THE MAST from the base by lifting it straight out of the base.

3.3.11 REMOVE THE BEARING from the base. Install a cap over the base to prevent debris and other contaminants from getting into the base.

3.4 Inspecting the Equipment

Important!

- Start an inspection program as soon as you put the crane into use.
- Appoint a qualified person to be responsible for regularly inspecting the equipment.
- Keep written records of inspection. This allows comparison with comments from previous inspections so you can see changes in condition or performance.

Perform frequent inspections:

- Before each operation.
- Every 3 hours during operation.
- Whenever you notice signs of damage or poor operation.

Frequent Wire Rope Inspection:

- Use ASME B30.7 as a guideline for rope inspection, replacement and maintenance.
- Check the wire rope, end connections and end fittings for corrosion, kinking, bending, crushing, birdcaging or other signs of damage.
- Check the number, distribution and type of visible broken wires. See paragraph 3.4.4 b and Figure 7.
- Check the wire rope for reduction of rope diameter from loss of core support, or wear of outside wires. See Figure 9.
- Take extra care when inspecting sections of rapid deterioration such as sections in contact with saddles, sheaves, repetitive pickup points, crossover points and end connections.

⚠WARNING

Do not use damaged or malfunctioning equipment. Place an "OUT OF ORDER" sign on the crane. Do not use the crane until the sign is removed by a qualified person who has completely corrected the problem.

Inspect the crane to detect signs of damage or poor operation before they become hazardous. See Table 2 Inspection Checklist.

3.4.1 CONSULT APPLICABLE CODES AND REGULATIONS for specific rules on inspecting the crane and other equipment.

3.4.2 REFER TO THE WINCH OWNER'S MANUAL for information regarding winch inspection.

3.4.3 **Instructions for Frequent Inspection**

a VISUALLY INSPECT the entire crane and all other equipment involved in the operation.

- Check all equipment for cracks, dents, bending, rust, wear, corrosion and other damage.
- Make sure the wire rope is installed correctly and anchored securely.
- Make sure the entire crane is properly lubricated.
- Make sure all fasteners are tight and secure.
- Make sure mounting fasteners are tightened securely.
- Check the ratchet jack for signs of leakage or damage, and make sure it operates smoothly to raise and lower the boom.
- Make sure the foundation is in good condition, and capable of supporting the crane and its load under all load conditions.

b TEST CRANE PERFORMANCE by operating the crane with a load not exceeding the load rating.

- Listen for unusual noises, and look for signs of damage as you operate the crane.
- Make sure the wire rope winds evenly and tightly onto the drum. If it is loose or uneven, rewind it before continuing.
- Make sure the load moves smoothly, without hesitation or strain.
- On hand operated models, make sure the winch handle rotates freely in both directions.
- On power operated models, make sure the winch responds to the control device. It must rotate as shown on the control labels, and it must turn off when you release the control.
- Make sure the boom rotates freely when you push the handle, and remains stationary when you release it.
- Check the winch brake. Raise the load, then lower it and stop it a few feet off the ground. If the load continues to coast or creep under normal operating conditions, the brake may be worn and in need of repair or replacement. Contact the factory.

Completely correct all problems before continuing. Use the Troubleshooting Chart to help determine the cause of certain problems. See Table 3.

Table 2 – Inspection Checklist

checked boxes indicate damage or problem in need of repair

	damages	problems
general	☐ finish weathered, flaking, otherwise damaged	☐ equipment not properly lubricated
	☐ parts cracked, bent, rusted, worn, otherwise damaged	☐ unusual noises, other signs of malfunction
foundation	☐ loose, unstable, otherwise damaged	☐ not level - boom swerves
fasteners	☐ stripped threads, bent, worn, otherwise damaged	☐ loose, not tightened to the proper torque
boom assembly	☐ holes worn, distorted, or otherwise damaged	☐ does not rotate freely
winch assembly	☐ gears, bearings, and other parts worn, otherwise damaged	☐ winch jerks or hesitates under load
	☐ brake corroded, cracked, worn, otherwise damaged	☐ brake does not operate properly
sheaves	☐ holes worn, distorted, or otherwise damaged	☐ does not rotate freely
wire rope	☐ bent, crushed, otherwise damaged	☐ wire rope loosely or unevenly wound
	☐ broken wires, see Figure 7	
	replace if more than 6 wires in one lay,	number per strand =
	or 3 wires in one strand in one lay, are broken	number per lay =
	☐ diameter reduced, see Figure 9	
	replace if diameter is excessively worn	diameter =
end connections	☐ corroded, rusted, worn, otherwise damaged	☐ not securely attached
load hook	☐ twisted, bent, worn, otherwise damaged, see Figure 8	☐ hook latch fails to close when released
	replace if twist is 10 degrees or more	twist =
	replace if throat width is 15% larger than nominal	throat width =
	replace if thickness is 10% less than nominal	thickness =
labels and plates	☐ dirty, illegible, otherwise damaged	☐ loosely attached or missing

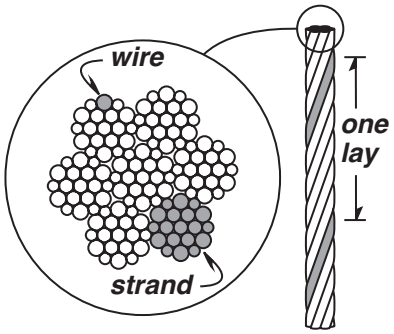
comments:

authorized signature: _____ **date** _____

Perform periodic inspections:

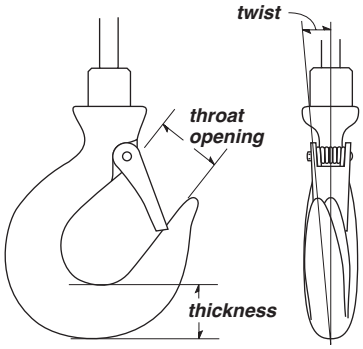
- Every 6 months.
- Whenever you return the crane to service from storage.
- Whenever you notice damage or poor operation in a frequent inspection.
- Whenever you have, or think you may have, overloaded or shock loaded the crane.

Figure 7 – Broken Wires



Wire rope assembly must be replaced if more than 6 wires are broken in one lay, or if more than 3 wires are broken in one strand in one lay.

Figure 8 – Load Hook Inspection



The wire rope assembly must be replaced if the throat opening is 15% wider than nominal, if the thickness is 10% less than nominal, or if the hook is twisted 10° or more.

3.4.4 Instructions for Periodic Inspection

a VISUALLY INSPECT the crane and all other equipment.

- Check the finish for wear, flaking, or other damage.
- Check all equipment for cracks, dents, bending, rust, wear, corrosion and other damage. If the equipment was overloaded, or if you notice cracks and other signs of overloading and damage, promptly remove equipment from use and have it repaired or replaced. **DO NOT CONTINUE TO USE DAMAGED OR OVERLOADED EQUIPMENT OR WIRE ROPE**.
- Check all fasteners for stripped threads, wear, bending, and other damage.
- Make sure the entire crane is properly lubricated.
- Check the ratchet jack for signs of leakage or damage, and make sure it operates smoothly to raise and lower the boom.
- Remove the ratched jack from the crane assembly. Test the travel limits of the ratchet jack. Make sure it does not fully un-thread.
- Make sure all labels and plates are readable, firmly attached, free of damage and clean. Replacements are available from the factory.

b INSPECT THE WIRE ROPE according to the wire rope manufacturer's recommendations, or follow accepted industry standards for wire rope inspection.

- Always wear protective clothing when handling wire rope.
- Check the entire length of wire rope for bent wires, crushed areas, broken or cut wires, corrosion, and other damage. Carefully inspect areas that pass over sheaves or through roller guides.
- Note the location and concentration of broken wires. Replace wire rope if more than 6 wires are broken in one lay, or more than 3 wires are broken in one strand in one lay. See Figure 7.
- Make sure the load hook or other device is securely attached to the wire rope, and the wire rope where it is attached is not frayed, corroded, broken, or otherwise damaged.
- Measure the throat opening, thickness, and twist of the hook. Replace the hook if it shows signs of damage. See Figure 8.
- Make sure hook latch opens without binding and closes when released.
- Check the anchor holes in the drum and the surrounding area for signs of wear or distortion.

c PLACE enough weight to keep the wire rope straight and tightly drawn.

- Measure the diameter of the wire rope, especially in areas where wear is noticeable. Replace the wire rope if the diameter measures below the minimum diameter at any point. See Figure 9.

d REMOVE THE WINCH and inspect it by following the instructions in the Winch Owner's Manual.

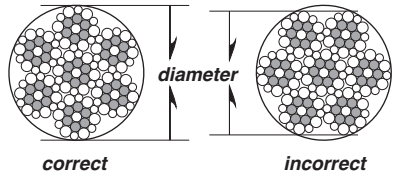
e DISASSEMBLE THE CRANE. Inspect each component for damage.

f REMOVE THE CRANE BASE from the foundation.

- Check fasteners for stripped threads, wear, bending, and other damage.
- Check the foundation for cracks, corrosion, and other damage.

g FASTEN THE CRANE BASE securely to the foundation.

Figure 9 – Rope Diameter



The wire rope assembly must be replaced if the diameter measures less than the minimum diameter at any point.

wire rope size	minimum diameter
3/16 in	11/64 in (.1719 in)
1/4 in	15/64 in (.2344 in)
5/16 in	19/64 in (.2969 in)
3/8 in	11/32 in (.3438 in)

h REASSEMBLE THE CRANE.

i TEST CRANE PERFORMANCE by operating the crane with a load equal to the load rating.

- Listen for unusual noises, and look for signs of damage as you operate the crane.
- Make sure the wire rope winds evenly and tightly onto the drum. If it is loose or uneven, rewind it before continuing.
- Make sure the load moves smoothly, without hesitation or strain.
- On hand operated models, make sure the winch handle rotates freely in both directions.
- On power operated models, make sure the winch responds to the control device. It must rotate as shown on the control labels, and it must turn off when you release the control.
- Make sure the boom rotates freely when you push the handle, and remains stationary when you release it.
- Check the brake. Raise the load, then lower it and stop it a few feet off the ground. If the load continues to coast or creep under normal operating conditions, the brake may be worn and in need of repair or replacement. Contact the factory.

Completely correct all problems before continuing. Use the Troubleshooting Chart to help determine the cause of certain problems. See Table 3.

Table 3 – Troubleshooting Chart

problem	cause	correction
overheating	• operated too long without rest	allow to cool
	• load too heavy	lighten load
	• poor lubrication	inspect and lubricate as necessary
	• bearing seized up	inspect and replace as necessary
boom bounces up and down	• load too heavy	lighten load
	• mounting bolts loose	tighten mounting bolts to proper torque
	• sheave worn or damaged	inspect and replace as necessary
	• foundation loose or unlevel	inspect and repair as necessary
	• winch gears worn or damaged	inspect and repair as necessary
boom does not rotate	• rotation points contaminated or worn	inspect and repair as necessary
	• flange bearing broken or locked	inspect and replace as necessary
boom rotates on its own	• foundation loose or unlevel	inspect and repair as necessary
	• mast bent, distorted, or leaning	inspect and repair as necessary
unusual noises		
high pitched squeak	• poor lubrication	lubricate entire crane properly
grinding noise	• contaminated lubricant at rotation points	clean and lubricate rotation points
rattling noise	• loose bolts, set screws or other fasteners	tighten all bolts and other fasteners
resistance felt in ratchet jack - boom not able to raise or lower to the published angle limits	• threaded ends of ratchet jack do not protrude equally from the jack	Adjust the threaded rod ends by removing the jack and turning the ends until an equal amount of threads are showing
ratchet jack fully un-threads	• travel limit pin damaged	contact Thern

Refer to the Winch Owner's Manual for possible problems with the winch and brake.

3.5 Repairing the Crane

Important!

- It is your responsibility to determine when to replace parts. When considering whether to continue using a part or to replace it, remember that replacing it is the best way to avoid further equipment damage.
- Appoint a qualified person to be responsible for all repairs to the equipment.

3.5.1 GET FACTORY AUTHORIZATION for all repairs. Unauthorized repairs will void the warranty, and may lead to damage or failure of the crane.

3.5.2 REPLACE DAMAGED OR POORLY OPERATING PARTS with Thern repair parts.

3.5.3 REFINISH AREAS where the paint is worn or flaking. A good finish helps to protect against corrosion and weather damage.

a REMOVE THE FINISH from damaged areas, down to the bare metal.

b CLEAN THE AREA thoroughly.

c REPAINT with a high quality primer and finishing coat.

3.5.4 TO ORDER REPAIR PARTS, contact your local dealer. Include the following information when ordering:

- model number
- serial number (or code number)
- part number
- date purchased, and from whom
- description of what happened, or what is wrong
- your name and return address

Table 4 – Crane Weight Chart

	Model 5PT5		Model 5PT10/5PT10C		Model 5PT20/5PTC20	
Component	**LB**	**KG**	**LB**	**KG**	**LB**	**KG**
Mast Assembly	28	12.7	36	16.3	66	29.9
Boom Assembly	26	11.8	34	15.4	75	34.0
Boom Ext Assembly	16	7.3	24	10.9	46	20.9
Ratchet Jack	12	5.5	12	5.5	12	5.5
Handle	2	0.9	7	3.2	7	3.2
TOTAL	84	38.1	113	51.3	206	93.5
Winch (including bracket)	**LB**	**KG**	**LB**	**KG**	**LB**	**KG**
M1 (M4022PB-K)	18	8.2	-	-	-	-
M1 (M4312PB-K)	-	-	30	13.6	34	15.4
M3 (M4042PBSS-K)	26	11.8	-	-	-	-
M3 (M4312PBSS-K)	-	-	30	13.6	34	15.4
M2 (4WM2-K)	39	17.7	40	18.2	44	20.0
E2 (4WP2-K)	74	33.6	75	34.0	79	35.8
E4 (4777-K)	96	43.5	97	44.0	101	45.8
E4DC (4777DC-K)	120	54.5	121	54.9	124	56.3

4.1 Transporting the Crane

Important!

- Keep a record of what you ship, and when you send it.

4.1.1 PARTIALLY DISASSEMBLE THE CRANE into components that can be transported.

4.1.2 PACK THE CRANE for transport, using the original packaging materials, if appropriate.

4.1.3 PACK THE WINCH for transport, using the original packaging materials, if appropriate. Please see the winch owner's manual for instructions.

4.1.4 REASSEMBLE THE CRANE at its new location following the instructions under Section 1.2 - Assembling the Crane.

4.1.5 INSPECT THE CRANE according to the Instructions for Frequent Inspection before installing it for operation. See Section 3.4.3 - Instructions for Frequent Inspection.

4.2 Storing the Crane

4.2.1 PARTIALLY DISASSEMBLE THE CRANE and store all parts in a cool clean place away from corrosive chemicals and moisture.

4.2.2 SEAL THE CRANE in plastic with a desiccant to help protect it from rust, corrosion, and other damage.

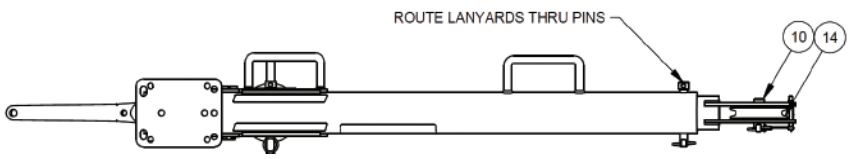
4.2.3 SEAL THE WINCH in plastic with a desiccant to help protect it from rust, corrosion, and other damage. Please see the winch owner's manual for instructions.

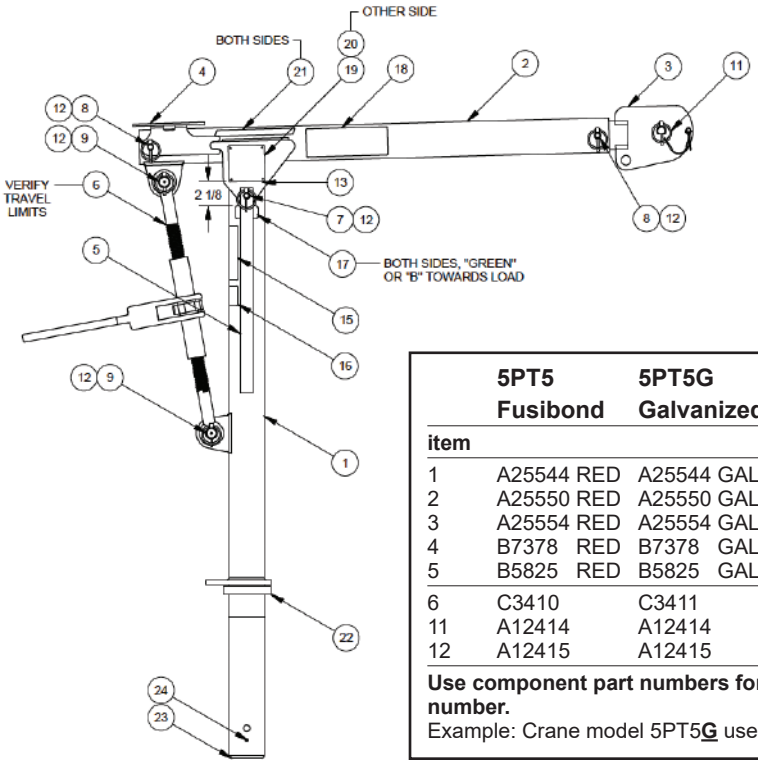
4.2.4 REASSEMBLE THE CRANE at its new location according to Section 1.2 - Assembling the Crane.

4.2.5 INSPECT THE CRANE according to Section 3.4.4 - Instructions for Periodic Inspection before installing it for operation.

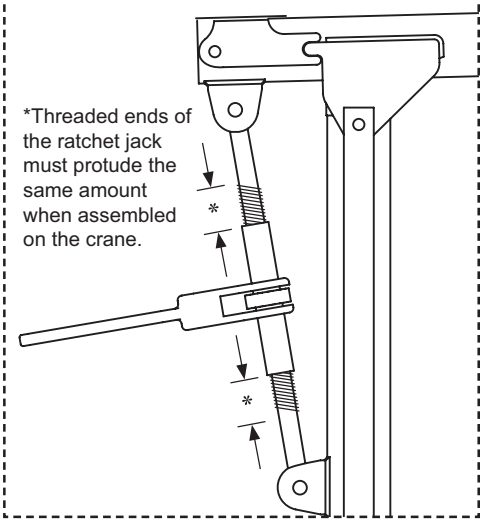
Model 5PT5

item	description	part number	qty.	material
1	**WELDMENT MAST 5PT5**	**A25544**	**1**	**SEE TABLE**
2	WELDMENT BOOM 5PT5	A25550	1	SEE TABLE
3	WELDMENT BOOM EXTENSION 5PT5	A25554	1	SEE TABLE
4	WELDMENT WINCH MOUNT 5Px5	B7378	1	SEE TABLE
5	HANDLE ROTATION SPx5	B5825	1	SEE TABLE
6	**JACK SCREW**	**SEE TABLE**	**1**	
7	PIN CLEVIS .500 X 4.500 EFF LENGTH SST	B7383	1	
8	PIN CLEVIS .500 X 3.500 EFF LENGTH SST	A22638	2	
9	PIN CLEVIS .906 X 2.750 EFF LENGTH SST	A12313	2	
10	**PIN CLEVIS .750 DIA 5PT SHEAVE SST**	**A12314**	**1**	
11	PIN LYNCH D ASSY	SEE TABLE	1	
12	PIN LYNCH ASSY - LANYARD NOT SHOWN	SEE TABLE	5	
13	PLUG FINISH RND 2.750 X 10-14 GA BLK	A14379	1	
14	SHEAVE ASSEMBLY	B2462	1	
15	**LABEL WARNING**	**B5790**	**1**	
16	LABEL WARNING BEFORE LOADING	B6229	1	
17	LABEL BOOM RANGE INDICATOR	B6230	2	
18	LABEL LOAD RATING 5PT5	B7411	1	
19	LABEL NAMEPLATE CRANES CE	A11529	1	
20	**LABEL THERN 1.00 X 3.20**	**A6889**	**1**	
21	LABEL MODEL COMMANDER	B6291	2	
22	FLANGE BEARING	B7386	1	
23	FLANGE BEARING	B7387	1	
24	PIN-SLOTTED SPRING .250X.750 SST	A4290	2	





Adjustable Ratchet Jack - Verify Travel Limits

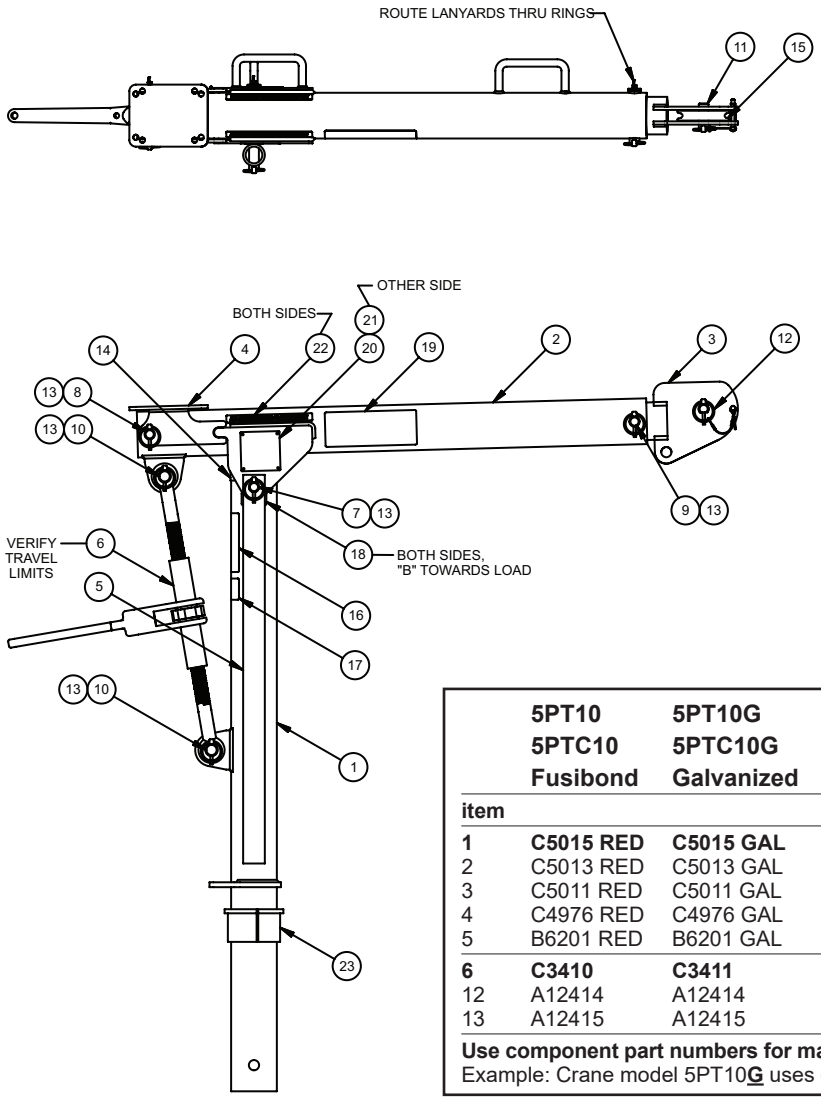


item	5PT5 Fusibond	5PT5G Galvanized	5PT5X Epoxy	5PT5S Stainless	5PT5S316 Stainless316
1	A25544 RED	A25544 GAL	A25544 EGRA	A25544 SS	A25544 SS316
2	A25550 RED	A25550 GAL	A25550 EGRA	A25550 SS	A25550 SS316
3	A25554 RED	A25554 GAL	A25554 EGRA	A25554 SS	A25554 SS316
4	B7378 RED	B7378 GAL	B7378 EGRA	B7378 SS	B7378 SS316
5	B5825 RED	B5825 GAL	B5825 EGRA	B5825 SS	B5825 SS316
6	C3410	C3411	C3411	C3411	C3411
11	A12414	A12414	A12414	A12414 SS	A12414 SS
12	A12415	A12415	A12415	A12415 SS	A12415 SS316

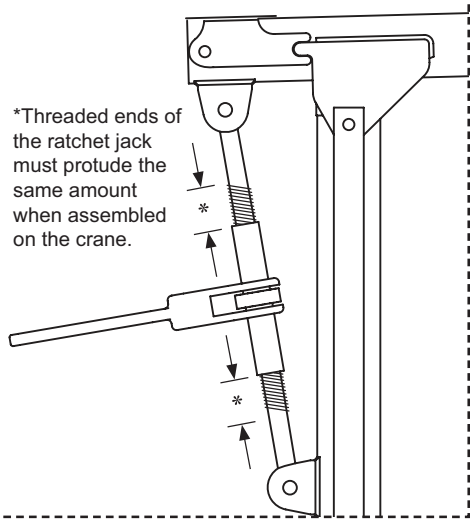
Use component part numbers for material / finish that matches crane model number.
Example: Crane model 5PT5**G** uses components with part numbers XXXXX**GAL**.

Model 5PT10/5PTC10

item	description	part number	qty.	material
1	**WELDMENT MAST 5PT10**	**C5015**	**1**	**SEE TABLE**
2	WELDMENT BOOM 5PT10	C5013	1	SEE TABLE
3	WELDMENT BOOM EXTENSION 5PT10	C5011	1	SEE TABLE
4	WELDMENT WINCH MOUNT 5Px10	C4976	1	SEE TABLE
5	HANDLE ROTATION 5PT	B6201	1	SEE TABLE
6	**JACK SCREW**	**SEE TABLE**	**1**	
7	PIN CLEVIS .750 X 6.125 EFF LENGTH SST	A12310	1	
8	PIN CLEVIS .750 X 4.250 EFF LENGTH SST	A12311	1	
9	PIN CLEVIS .750 X 3.750 EFF LENGTH SST	A12312	1	
10	PIN CLEVIS .906 X 2.750 EFF LENGTH SST	A12313	2	
11	**PIN CLEVIS .750 DIA 5PT SHEAVE SST**	**A12314**	**1**	
12	PIN LYNCH D ASSY	SEE TABLE	1	
13	PIN LYNCH ASSY - LANYARD NOT SHOWN	SEE TABLE	5	
14	PLUG FINISH RND 3.000 X SCH 40-160 RED	A13550	1	
15	SHEAVE ASSEMBLY	B2462	1	
16	**LABEL WARNING**	**B5790**	**1**	
17	LABEL WARNING BEFORE LOADING	B6229	1	
18	LABEL BOOM RANGE INDICATOR	B6230	2	
19	LABEL LOAD RATING 5PT10	B6231	1	
19	LABEL LOAD RATING 5PTC10	A24280	1	
20	LABEL NAMEPLATE CRANES CE	A11529	1	
21	**LABEL THERN 1.00 X 3.20**	**A6889**	**1**	
22	LABEL MODEL COMMANDER	B6291	2	
23	FLANGE BEARING	B6592	1	



Adjustable Ratchet Jack - Verify Travel Limits

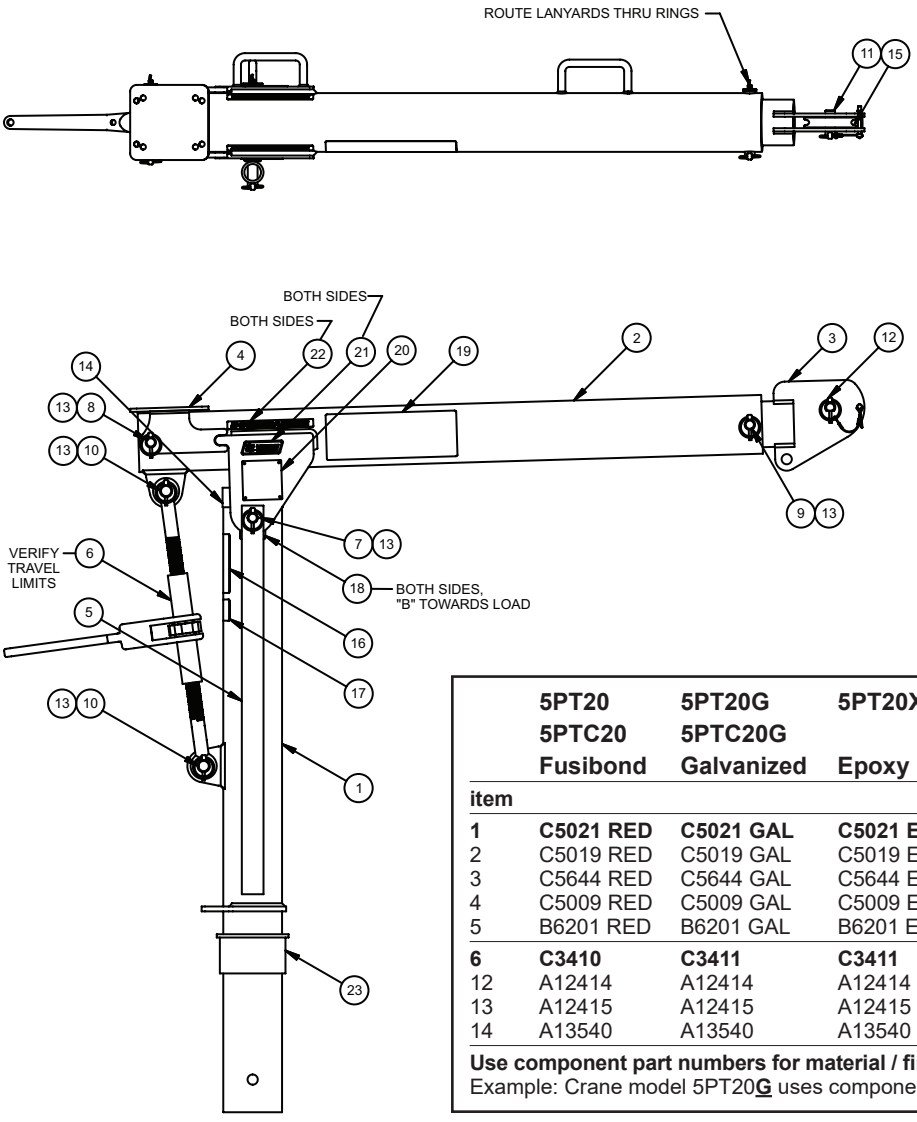


	5PT10 5PTC10 Fusibond	5PT10G 5PTC10G Galvanized	5PT10X Epoxy	5PT10S 5PTC10S Stainless	5PT10S316 Stainless316
item					
1	**C5015 RED**	**C5015 GAL**	**C5015 EGRA**	**C5015 SS**	**C5015 SS316**
2	C5013 RED	C5013 GAL	C5013 EGRA	C5013 SS	C5013 SS316
3	C5011 RED	C5011 GAL	C5011 EGRA	C5011 SS	C5011 SS316
4	C4976 RED	C4976 GAL	C4976 EGRA	C4976 SS	C4976 SS316
5	B6201 RED	B6201 GAL	B6201 EGRA	B6201 SS	B6201 SS316
6	**C3410**	**C3411**	**C3411**	**C3411**	**C3411**
12	A12414	A12414	A12414	A12414 SS	A12414 SS
13	A12415	A12415	A12415	A12415 SS	A12415 SS316

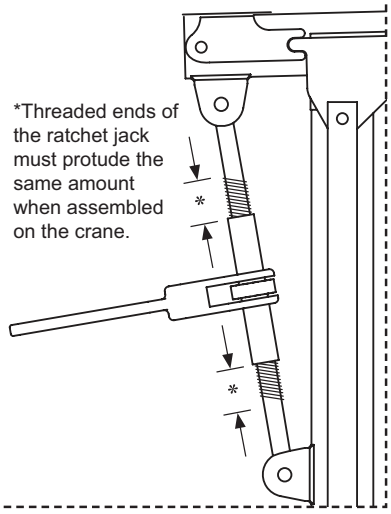
Use component part numbers for material / finish that matches crane model number.
Example: Crane model 5PT10**G** uses components with part numbers XXXXX**GAL**.

Model 5PT20/5PTC20

item	description	part number	qty.	material
1	**WELDMENT MAST 5PT20**	**C5021**	**1**	**SEE TABLE**
2	WELDMENT BOOM 5PT20	C5019	1	SEE TABLE
3	WELDMENT BOOM EXTENSION 5PT20	C5644	1	SEE TABLE
4	WELDMENT WINCH MOUNT 5Px20	C5009	1	SEE TABLE
5	HANDLE ROTATION 5PT	B6201	1	SEE TABLE
6	**JACK SCREW**	**SEE TABLE**	**1**	
7	PIN CLEVIS 1.250 DIA 5PT MAST SST	A12315	1	
8	PIN CLEVIS .750 X 5.500 EFF LENGTH SST	A12316	1	
9	PIN CLEVIS .750 X 4.750 EFF LENGTH SST	A12317	1	
10	PIN CLEVIS .906 X 2.750 EFF LENGTH SST	A12313	2	
11	**PIN CLEVIS .750 DIA 5PT SHEAVE SST**	**A12314**	**1**	
12	PIN LYNCH D ASSY	SEE TABLE	1	
13	PIN LYNCH ASSY - LANYARD NOT SHOWN	SEE TABLE	5	
14	PLUG FINISH RND 4.000 X 10-16 GA BLK	SEE TABLE	1	
15	SHEAVE ASSEMBLY	A24528	1	
16	**LABEL WARNING**	**B5790**	**1**	
17	LABEL WARNING BEFORE LOADING	B6229	1	
18	LABEL BOOM RANGE INDICATOR	B6230	2	
19	LABEL LOAD RATING 5PT20	B6232	1	
19	LABEL LOAD RATING 5PTC20	A24281	1	
20	LABEL NAMEPLATE CRANES CE	A11529	1	
21	**LABEL THERN 1.00 X 3.20**	**A6889**	**1**	
22	LABEL MODEL COMMANDER	B6291	2	
23	FLANGE BEARING	B6593	1	



Adjustable Ratchet Jack - Verify Travel Limits



	5PT20 5PTC20 Fusibond	5PT20G 5PTC20G Galvanized	5PT20X Epoxy	5PT20S 5PTC20S Stainless	5PT20S316 Stainless316
item					
1	**C5021 RED**	**C5021 GAL**	**C5021 EGRA**	**C5021 SS**	**C5021 SS316**
2	C5019 RED	C5019 GAL	C5019 EGRA	C5019 SS	C5019 SS316
3	C5644 RED	C5644 GAL	C5644 EGRA	C5644 SS	C5644 SS316
4	C5009 RED	C5009 GAL	C5009 EGRA	C5009 SS	C5009 SS316
5	B6201 RED	B6201 GAL	B6201 EGRA	B6201 SS	B6201 SS316
6	**C3410**	**C3411**	**C3411**	**C3411**	**C3411**
12	A12414	A12414	A12414	A12414 SS	A12414 SS
13	A12415	A12415	A12415	A12415 SS	A12415 SS316
14	A13540	A13540	A13540	A13541	A13541

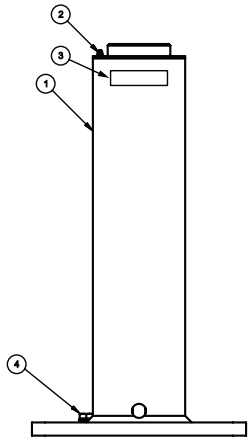
Use component part numbers for material / finish that matches crane model number.
Example: Crane model 5PT20**G** uses components with part numbers XXXXX**GAL**.

Pedestal Base
5BP5 Series

item	part no.	description
1	**SEE TABLE**	**WELDMENT BASE 5BP5**
2	5BC5	BASE COVER W/LANYARD
3	A14588	LABEL THERN
4	A14615	RETAINER PUSH

[1] When ordering parts, be sure to specify whether the finish is red, galvanized, epoxy or stainless.

	5BP5	5BP5G	5BP5X	5BP5S	5BP5S316
item					
1	**B5821 RED**	**B5821 GAL**	**B5821 EGRA**	**B5821 SS**	**B5821 SS316**



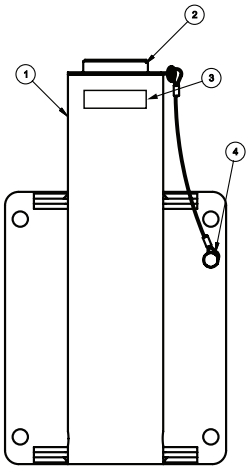
5BP5
Pedestal Base

Wall Base
5BW5 Series

item	part no.	description
1	**SEE TABLE**	**WELDMENT BASE 5BW5**
2	5BC5	BASE COVER W/LANYARD
3	A14588	LABEL THERN
4	A14615	RETAINER PUSH

[1] When ordering parts, be sure to specify whether the finish is red, galvanized, epoxy or stainless.

	5BW5	5BW5G	5BW5X	5BW5S	5BW5S316
item					
1	**B5819 RED**	**B5819 GAL**	**B5819 EGRA**	**B5819 SS**	**B5819 SS316**



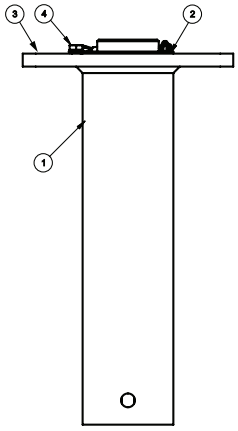
5BW5
Wall Base

Flush Base
5BF5 Series

item	part no.	description
1	**SEE TABLE**	**WELDMENT BASE 5BF5**
2	5BC5	BASE COVER W/LANYARD
3	A14588	LABEL THERN
4	A14615	RETAINER PUSH

[1] When ordering parts, be sure to specify whether the finish is red, galvanized, epoxy or stainless.

	5BF5	5BF5G	5BF5X	5BF5S	5BF5S316
item					
1	**B5820 RED**	**B5820 GAL**	**B5820 EGRA**	**B5820 SS**	**B5820 SS316**



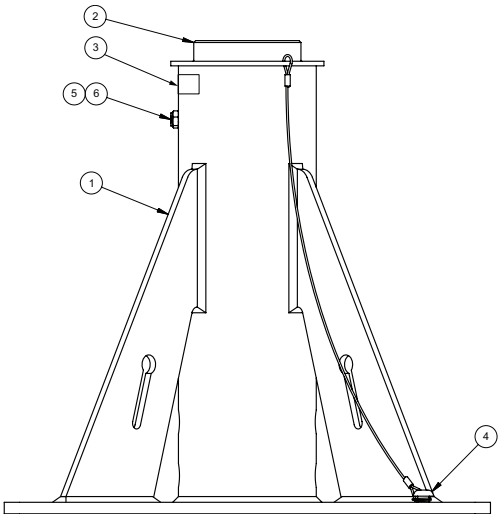
5BF5
Flush Base

Pedestal Base
5BP10, 5BP20[1]

item	part no.	description
1	**SEE TABLE**	**WELDMENT BASE 5PT**
2	SEE TABLE	BASE COVER W/LANYARD
3	A14588	LABEL THERN
4	A14615	RETAINER PUSH
5	A4379	NUT HEX JAM NYLK .312-18NC SST 18-8
6	A13820	CAPSCR SOKLHD .312-18NC X .500 ZNPL

[1] When ordering parts, be sure to specify whether the finish is red, galvanized, epoxy or stainless.

	5BP10	5BP10G	5BP10X	5BP10S	5BP10S316
item					
1	**B6181 RED**	**B6181 GAL**	**B6181 EGRA**	**B6181 SS**	**B6181 SS316**
2	5BC10	5BC10	5BC10	5BC10	5BC10
	5BP20	**5BP20G**	**5BP20X**	**5BP20S**	**5BP20S316**
item					
1	**B6191 RED**	**B6191 GAL**	**B6191 EGRA**	**B6191 SS**	**B6191 SS316**
2	5BC20	5BC20	5BC20	5BC20	5BC20



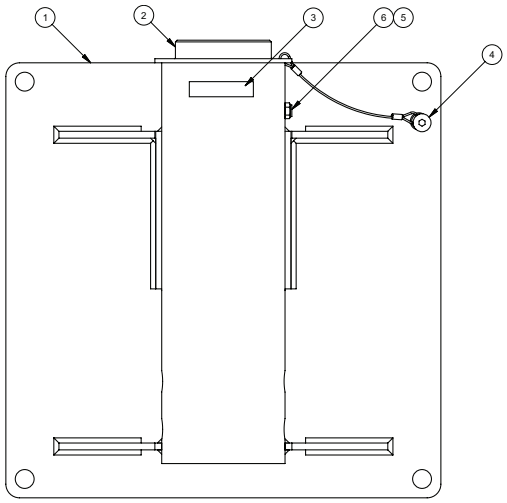
5BP10, 5BP20
Pedestal Base

Wall Base
5BW10, 5BW20[1]

item	part no.	description
1	**SEE TABLE**	**WELDMENT BASE 5PT**
2	SEE TABLE	BASE COVER W/LANYARD
3	A14588	LABEL THERN
4	A14615	RETAINER PUSH
5	A13820	CAPSCR SOKLHD .312-18NC X .500 ZNPL
6	A4379	NUT HEX JAM NYLK .312-18NC SST 18-8

[1] When ordering parts, be sure to specify whether the finish is red, galvanized, epoxy or stainless.

	5BW10	5BW10G	5BW10X	5BW10S	5BW10S316
item					
1	**B6179 RED**	**B6179 GAL**	**B6179 EGRA**	**B6179 SS**	**B6179 SS316**
2	5BC10	5BC10	5BC10	5BC10	5BC10
	5BW20	**5BW20G**	**5BW20X**	**5BW20S**	**5BW20S316**
item					
1	**B6189 RED**	**B6189 GAL**	**B6189 EGRA**	**B6189 SS**	**B6189 SS316**
2	5BC20	5BC20	5BC20	5BC20	5BC20



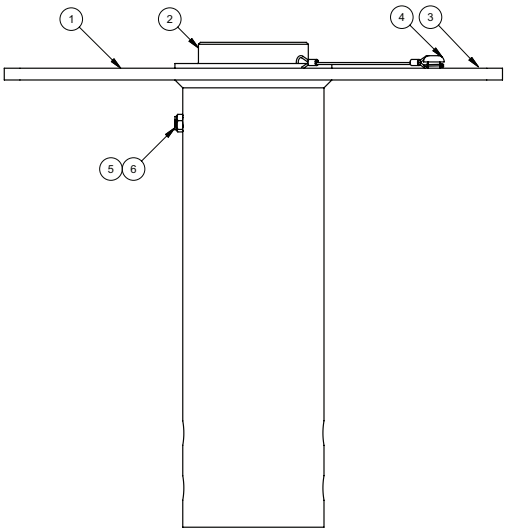
5BW10, 5BW20
Wall Base

Flush Base
5BF10, 5BF20[1]

item	part no.	description
1	**SEE TABLE**	**WELDMENT BASE 5PT**
2	SEE TABLE	BASE COVER W/LANYARD
3	A14588	LABEL THERN
4	A14615	RETAINER PUSH
5	A13820	CAPSCR SOKLHD .312-18NC X .500 ZNPL
6	A4379	NUT HEX JAM NYLK .312-18NC SST 18-8

[1] When ordering parts, be sure to specify whether the finish is red, galvanized, epoxy or stainless.

	5BF10	5BF10G	5BF10X	5BF10S	5BF10S316
item					
1	**B6180 RED**	**B6180 GAL**	**B6180 EGRA**	**B6180 SS**	**B6180 SS316**
2	5BC10	5BC10	5BC10	5BC10	5BC10
	5BF20	**5BF20G**	**5BF20X**	**5BF20S**	**5BF20S316**
item					
1	**B6190 RED**	**B6190 GAL**	**B6190 EGRA**	**B6190 SS**	**B6190 SS316**
2	5BC20	5BC20	5BC20	5BC20	5BC20



5BF10, 5BF20
Flush Base

Two Part Line Option		Model 5PT10TPL and 5PT20TPL	
item	description	part number	qty.
1	**BLOCK SNATCH WITH HOOK**	**A4779**	**1**
2	SWIVEL REGULAR CHAIN GALV	A7306	1
3	PIN CLEVIS .750 X 1.500 EFF LENGTH SST	A12703	1
4	PIN LYNCH .188 X 1.000 SST	A12416	1
5	HOOK LATCH KIT	A9028	1

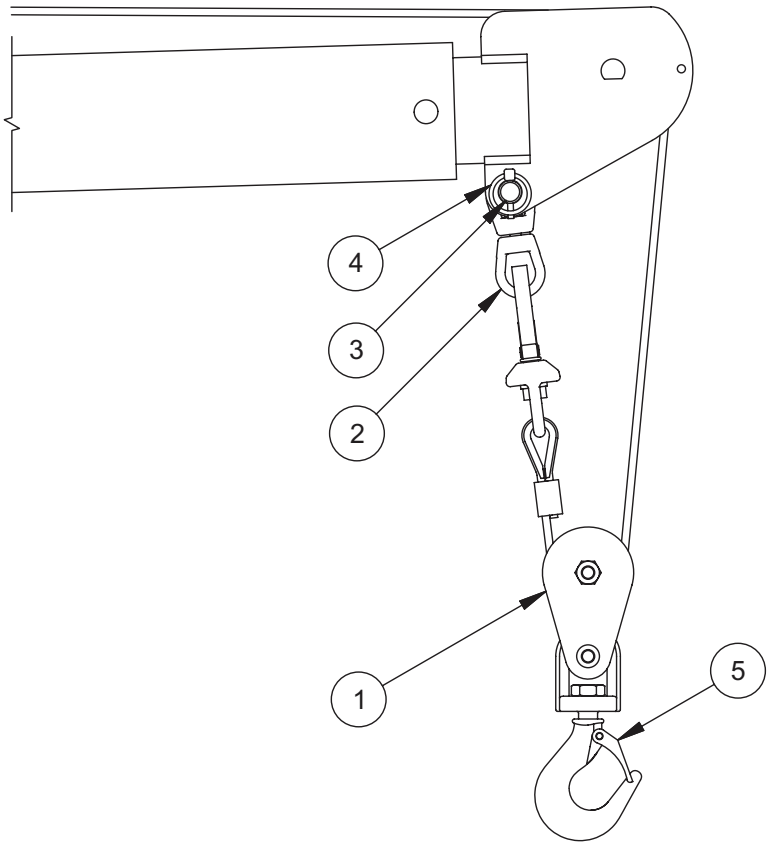


Table 5 – Winch Part Numbers

5PT5 Series	-M1	-M2	-M2X	-M3
Description	Part Number	Part Number	Part Number	Part Number
MANUAL WINCH	M4022PB-K	4WM2-K	4WM2EGRA-K	M4042PBSS-K

5PT10/20 Series	-M1	-M2	-M2X	-M3
Description	Part Number	Part Number	Part Number	Part Number
MANUAL WINCH	M4312PB-K	4WM2-K	4WM2EGRA-K	M4312PBSS-K

5PT5/10/20 Series	-E2	-E4	-E4DC
Description	Part Number	Part Number	Part Number
ELECTRIC WINCH ADAPTER PLATE	4WP2-K	4777-K C3114	4777DC-K C5137

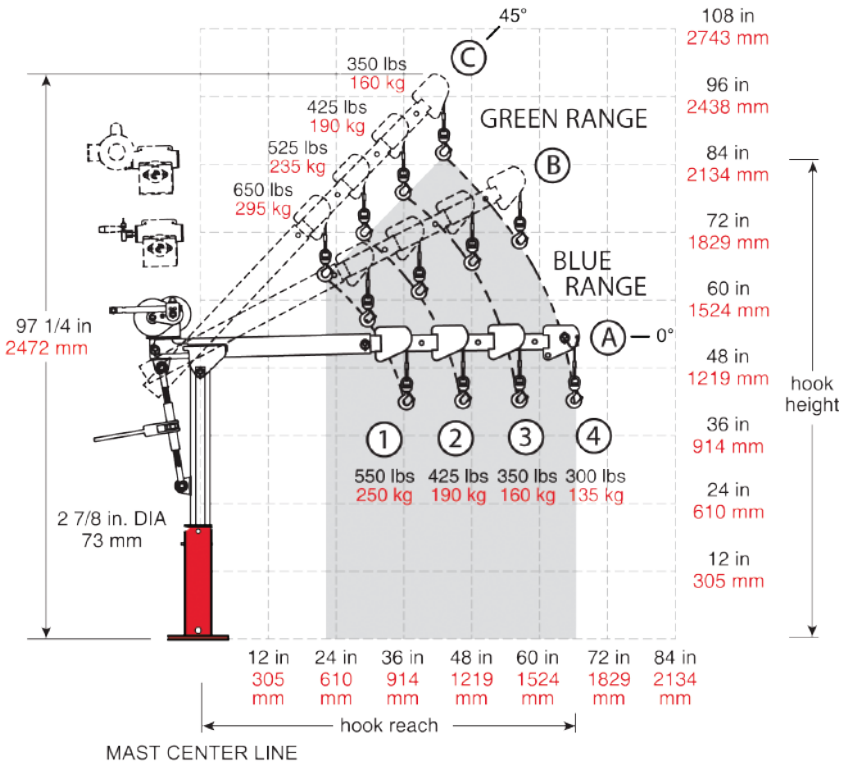
5PT5/10/20 Series	-E2X	-E4X	-E4DCX
Description	Part Number	Part Number	Part Number
ELECTRIC WINCH ADAPTER PLATE	4WP2EGRA-K	4777EGRA-K C3114EGRA	4777DCEGRA-K C5137EGRA

5PT5 Series Lift Below Floor [2]

Lift Below [1] Floor				Wire Rope Diameter		Wire Rope [3] Length		Winch Configurations				
Minimum (C4)		Maximum (C1)						M1	M2	M3	E2	E4
(ft)	(m)	(ft)	(m)	(in)	(mm)	(ft)	(m)					
2	0.6	7	2.1	3/16	5	20	6.0	x	-	x	-	x
10	3.0	15	4.5	3/16	5	28	8.5	x	-	x	-	x
18	5.4	23	7.0	3/16	5	36	10.9	x	-	x	-	x
27	8.2	32	9.7	3/16	5	45	13.7	x	-	x	-	x
42	12.8	47	14.3	3/16	5	60	18.2	x	-	x	-	x
57	17.3	62	18.8	3/16	5	75	22.8	-	-	x	-	x
72	21.9	77	23.4	3/16	5	90	27.4	-	-	x	-	x
2	0.6	7	2.1	1/4	6	20	6.0	-	x	x	x	x
10	3.0	15	4.5	1/4	6	28	8.5	-	x	x	x	x
18	5.4	23	7.0	1/4	6	36	10.9	-	x	x	x	x
27	8.2	32	9.7	1/4	6	45	13.7	-	x	x	x	x
42	12.8	47	14.3	1/4	6	60	18.2	-	x	x	x	x
57	17.3	62	18.8	1/4	6	75	22.8	-	x	-	x	x

Commander 5PT5 Hook Height and Reach [2]

	Boom Position	Load Range Ratings		Hook Reach		Hook Height	
		(lb)	(kg)	(in)	(mm)	(in)	(mm)
BLUE RANGE	A-1	550	250	36	914	42	1066
	A-2	425	190	46	1168	42	1066
	A-3	350	160	56	1422	42	1066
	A-4	300	135	66	1676	42	1066
GREEN RANGE	B-1	650	295	30	762	56	1422
	B-2	525	235	38	965	60	1524
	B-3	425	190	46	1168	65	1651
	B-4	350	160	54	1371	69	1752
	C-1	650	295	23	584	64	1625
	C-2	525	235	29	736	71	1803
	C-3	425	190	36	914	77	1955
	C-4	350	160	42	1066	84	2133



IMPORTANT:
It is the owner or operator's responsibility to determine the suitability of the equipment to its intended use. Study all applicable codes, manuals and regulations. Be sure to read the Owner's Manual supplied with the equipment before operating it.

[1] Lift below floor level varies depending on boom position and base configuration. For longer lifts, including use with two-part lines kits, please contact factory.

[2] Performance Characteristics are for standard products referred to in this manual. Non-standard products may vary from the original design. Contact Thern, Inc. for this information.

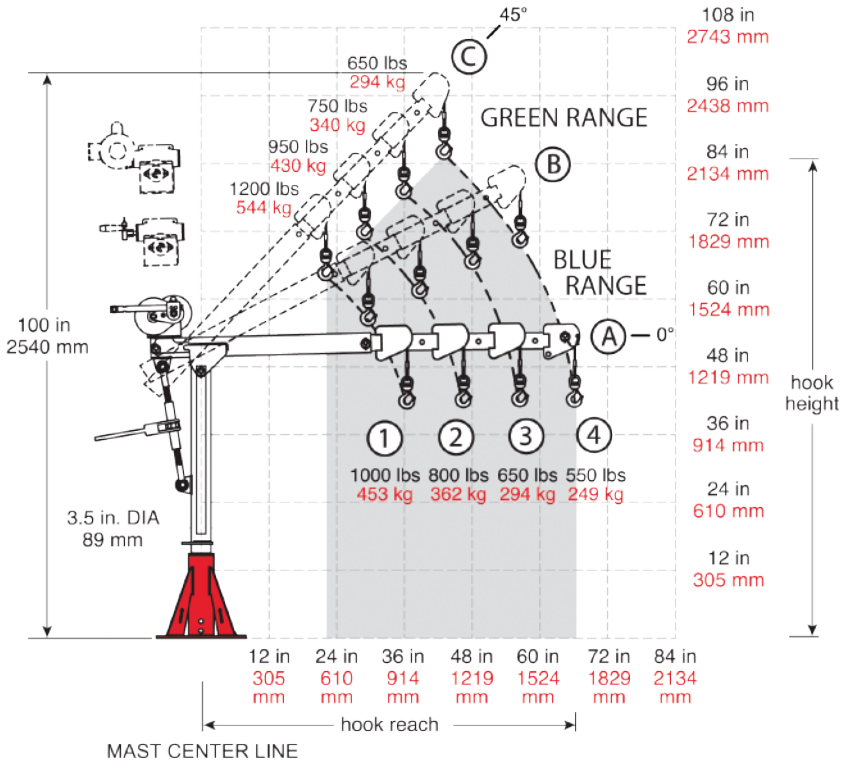
[3] Wire rope assemblies include a hook and a swaged ball fitting to work with quick disconnect anchor on the winch. 316SS wire rope is available. Please contact the factory.

5PT10 Series Lift Below Floor [2]

Lift Below [1] Floor				Wire Rope Diameter		Wire Rope [3] Length		Winch Configurations				
Minimum (C4)		Maximum (C1)						M1	M2	M3	E2	E4
(ft)	(m)	(ft)	(m)	(in)	(mm)	(ft)	(m)					
2	0.6	7	2.1	3/16	5	20	6.0	x	-	x	-	x
10	3.0	15	4.5	3/16	5	28	8.5	x	-	x	-	x
18	5.4	23	7.0	3/16	5	36	10.9	x	-	x	-	x
27	8.2	32	9.7	3/16	5	45	13.7	x	-	x	-	x
42	12.8	47	14.3	3/16	5	60	18.2	x	-	x	-	x
57	17.3	62	18.8	3/16	5	75	22.8	-	-	x	-	x
72	21.9	77	23.4	3/16	5	90	27.4	-	-	x	-	x
2	0.6	7	2.1	1/4	6	20	6.0	-	x	x	x	x
10	3.0	15	4.5	1/4	6	28	8.5	-	x	x	x	x
18	5.4	23	7.0	1/4	6	36	10.9	-	x	x	x	x
27	8.2	32	9.7	1/4	6	45	13.7	-	x	x	x	x
42	12.8	47	14.3	1/4	6	60	18.2	-	x	x	x	x
57	17.3	62	18.8	1/4	6	75	22.8	-	x	-	x	x
2	0.6	7	2.1	5/16	8	20	6.0	-	-	-	-	x
10	3.0	15	4.5	5/16	8	28	8.5	-	-	-	-	x
18	5.4	23	7.0	5/16	8	36	10.9	-	-	-	-	x
27	8.2	32	9.7	5/16	8	45	13.7	-	-	-	-	x
42	12.8	47	14.3	5/16	8	60	18.2	-	-	-	-	x

Commander 5PT10 Hook Height and Reach [2]

	Boom Position	Load Range Ratings		Hook Reach		Hook Height	
		(lb)	(kg)	(in)	(mm)	(in)	(mm)
BLUE RANGE	A-1	1000	453	36	914	42	1066
	A-2	800	362	46	1168	42	1066
	A-3	650	294	56	1422	42	1066
	A-4	550	249	66	1676	42	1066
GREEN RANGE	B-1	1200	544	29	736	56	1422
	B-2	950	430	38	965	60	1524
	B-3	750	340	47	1193	65	1651
	B-4	650	294	56	1422	69	1752
	C-1	1200	544	22	558	64	1625
	C-2	950	430	29	736	71	1803
	C-3	750	340	36	914	78	1981
	C-4	650	294	43	1092	85	2159



IMPORTANT:
It is the owner or operator's responsibility to determine the suitability of the equipment to its intended use. Study all applicable codes, manuals and regulations. Be sure to read the Owner's Manual supplied with the equipment before operating it.

[1] Lift below floor level varies depending on boom position and base configuration. For longer lifts, including use with two-part lines kits, please contact factory.

[2] Performance Characteristics are for standard products referred to in this manual. Non-standard products may vary from the original design. Contact Thern, Inc. for this information.

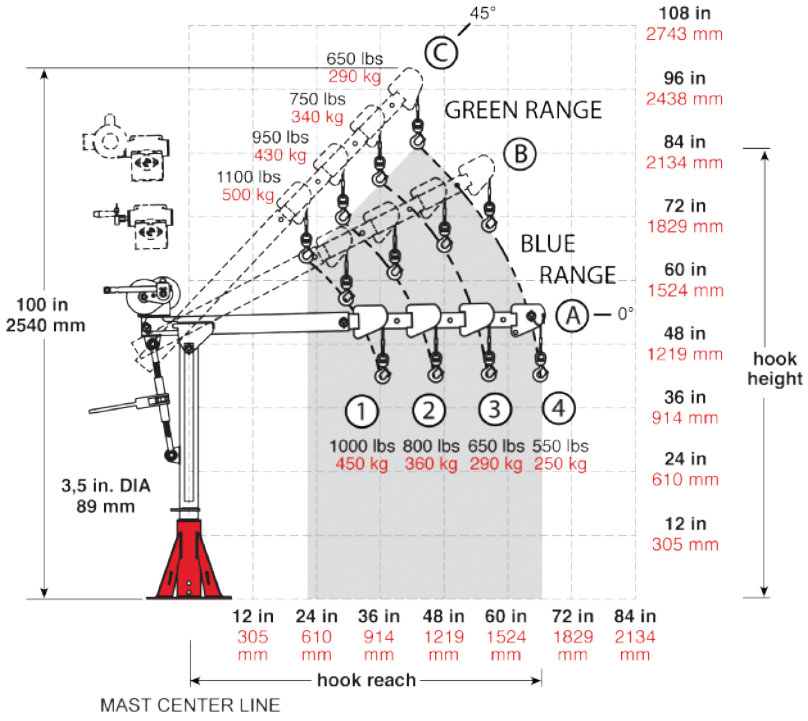
[3] Wire rope assemblies include a hook and a swaged ball fitting to work with quick disconnect anchor on the winch.

5PTC10 Series Lift Below Floor [2]

Lift Below [1] Floor				Wire Rope Diameter		Wire Rope [3] Length		Winch Configurations				
Minimum (C4)		Maximum (C1)						M1	M2	M3	E2	E4
(ft)	(m)	(ft)	(m)	(in)	(mm)	(ft)	(m)					
2	0.6	7	2.1	1/4	6	20	6.0	x	x	x	x	x
10	3.0	15	4.5	1/4	6	28	8.5	x	x	x	x	x
18	5.4	23	7.0	1/4	6	36	10.9	x	x	x	x	x
27	8.2	32	9.7	1/4	6	45	13.7	x	x	x	x	x
42	12.8	47	14.3	1/4	6	60	18.2	x	x	x	x	x
57	17.3	62	18.8	1/4	6	75	22.8	-	x	-	x	x

Commander 5PTC10 Hook Height and Reach [2]

	Boom Position	Load Range Ratings		Hook Reach		Hook Height	
		(lb)	(kg)	(in)	(mm)	(in)	(mm)
BLUE RANGE	A-1	1000	450	36	914	42	1066
	A-2	800	360	46	1168	42	1066
	A-3	650	290	56	1422	42	1066
	A-4	550	250	66	1676	42	1066
GREEN RANGE	B-1	1100	500	29	736	56	1422
	B-2	950	430	38	965	60	1524
	B-3	750	340	47	1193	65	1651
	B-4	650	290	56	1422	69	1752
	C-1	1100	500	22	558	64	1625
	C-2	950	430	29	736	71	1803
	C-3	750	340	36	914	78	1981
	C-4	650	290	43	1092	85	2159



IMPORTANT:
It is the owner or operator's responsibility to determine the suitability of the equipment to its intended use. Study all applicable codes, manuals and regulations. Be sure to read the Owner's Manual supplied with the equipment before operating it.

[1] Lift below floor level varies depending on boom position and base configuration. For longer lifts, including use with two-part lines kits, please contact factory.

[2] Performance Characteristics are for standard products referred to in this manual. Non-standard products may vary from the original design. Contact Thern, Inc. for this information.

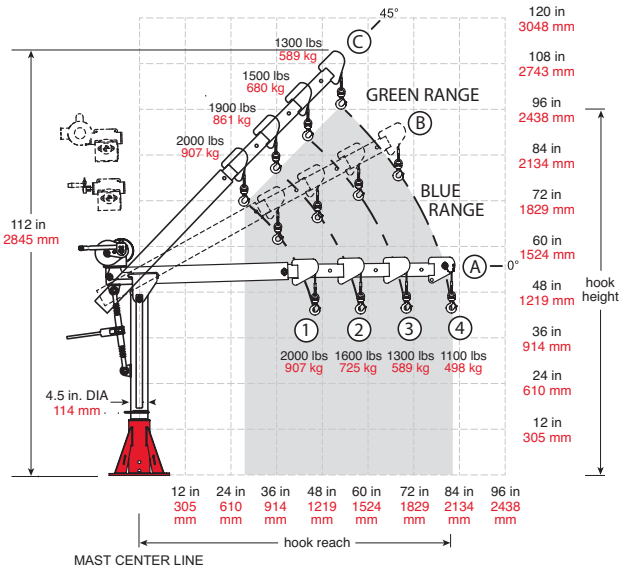
[3] Wire rope assemblies include a hook and a swaged ball fitting to work with quick disconnect anchor on the winch.

5PT20 Series Lift Below Floor [2]

Lift Below [1] Floor				Wire Rope Diameteter		Wire Rope [3] Length		Winch Configurations				
Minimum (C4)		Maximum (C1)						M1	M2	M3	E2	E4
(ft)	(m)	(ft)	(m)	(in)	(mm)	(ft)	(m)					
0	0.0	5	1.5	3/16	5	20	6.0	x	-	x	-	x
8	2.4	13	3.9	3/16	5	28	8.5	x	-	x	-	x
16	4.8	21	6.4	3/16	5	36	10.9	x	-	x	-	x
25	7.6	30	9.1	3/16	5	45	13.7	x	-	x	-	x
40	12.1	45	13.7	3/16	5	60	18.2	x	-	x	-	x
55	16.7	60	18.2	3/16	5	75	22.8	x	-	x	-	x
70	21.3	75	22.8	3/16	5	90	27.4	x	-	x	-	x
0	0.0	5	1.5	1/4	6	20	6.0	x	x	x	x	x
8	2.4	13	3.9	1/4	6	28	8.5	x	x	x	x	x
16	4.8	21	6.4	1/4	6	36	10.9	x	x	x	x	x
25	7.6	30	9.1	1/4	6	45	13.7	x	x	x	x	x
40	12.1	45	13.7	1/4	6	60	18.2	x	x	x	x	x
55	16.7	60	18.2	1/4	6	75	22.8	-	x	-	x	x
0	0.0	5	1.5	5/16	8	20	6.0	x[4]	x[4]	x[4]	x[4]	x
8	2.4	13	3.9	5/16	8	28	8.5	x[4]	x[4]	x[4]	x[4]	x
16	4.8	21	6.4	5/16	8	36	10.9	x[4]	x[4]	x[4]	x[4]	x
25	7.6	30	9.7	5/16	8	45	13.7	x[4]	x[4]	x[4]	x[4]	x
40	12.1	45	13.7	5/16	8	60	18.2	-	-	-	-	x

5PT20 Performance Ratings [2]

	Boom Position	1st Layer Load Rating		Mid Drum Load Rating		Full Drum Load Rating		Hook Reach		Hook Height	
		(lb)	(kg)	(lb)	(kg)	(lb)	(kg)	(in)	(mm)	(in)	(mm)
BLUE RANGE	A-1	2000	907	1500	680	1200	544	46	1168	43	1092
	A-2	1600	725	1500	680	1200	544	58	1473	43	1092
	A-3	1300	589	1300	589	1200	544	70	1778	43	1092
	A-4	1100	498	1100	498	1100	498	82	2082	43	1092
GREEN RANGE	B-1	2000	907	1500	680	1200	544	37	939	61	1549
	B-2	1900	861	1500	680	1200	544	48	1219	67	1701
	B-3	1500	680	1500	680	1200	544	58	1473	72	1828
	B-4	1300	589	1300	589	1200	544	69	1752	78	1981
	C-1	2000	907	1500	680	1200	544	28	711	71	1803
	C-2	1900	861	1500	680	1200	544	36	914	80	2032
	C-3	1500	680	1500	680	1200	544	45	1143	88	2235
	C-4	1300	589	1300	589	1200	544	53	1346	97	2463



5PT20 Performance Ratings with Two-Part Line Kit [2]

	Boom Position	1st Layer Load Rating		Mid Drum Load Rating		Full Drum Load Rating		Hook Reach		Hook Height	
		(lb)	(kg)	(lb)	(kg)	(lb)	(kg)	(in)	(mm)	(in)	(mm)
BLUE RANGE	A-1	2000	907	2000	907	2000	907	43	1092	31	787
	A-2	1600	725	1600	725	1600	725	55	1397	31	787
	A-3	1300	589	1300	589	1300	589	67	1701	31	787
	A-4	1100	498	1100	498	1100	498	79	2006	31	787
GREEN RANGE	B-1	2400	1088	2400	1088	2400	1088	35	889	49	1244
	B-2	1900	861	1900	861	1900	861	46	1168	55	1397
	B-3	1500	680	1500	680	1500	680	56	1422	60	1524
	B-4	1300	589	1300	589	1300	589	67	1701	66	1676
	C-1	2400	1088	2400	1088	2400	1088	27	658	59	1498
	C-2	1900	861	1900	861	1900	861	35	889	68	1727
	C-3	1500	680	1500	680	1500	680	44	1117	76	1930
	C-4	1300	589	1300	589	1300	589	52	1320	85	2159

[1] Lift below floor level varies depending on boom position and base configuration. For long lifts (up to 350') please contact factory.

[2] Performance Characteristics are for standard products referred to in this manual. Non-standard products may vary from the original design.
Contact Thern, Inc. for this information.

[3] Wire rope assemblies include a hook and a swaged ball fitting to work with quick disconnect anchor on the winch. 316SS wire rope is available. Please contact the factory.

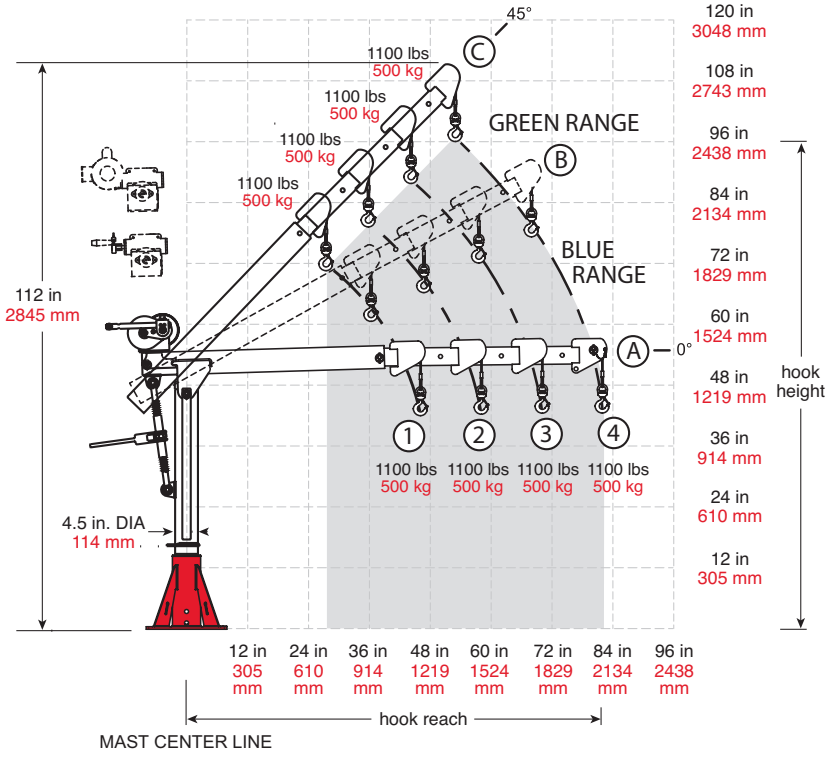
[4] 5/16" (8 mm) wire rope assemblies with swaged ball fitting do not fit the winch quick disconnect anchor. - Contact the factory to specify wire rope with an unfinished end.

5PTC20 Series Lift Below Floor [2]

Lift Below [1] Floor				Wire Rope Diameteter		Wire Rope [3] Length		Winch Configurations				
Minimum (C4)		Maximum (C1)						M1	M2	M3	E2	E4
(ft)	(m)	(ft)	(m)	(in)	(mm)	(ft)	(m)					
0	0.0	5	1.5	1/4	6	20	6.0	x	x	x	x	x
8	2.4	13	3.9	1/4	6	28	8.5	x	x	x	x	x
16	4.8	21	6.4	1/4	6	36	10.9	x	x	x	x	x
25	7.6	30	9.1	1/4	6	45	13.7	x	x	x	x	x
40	12.1	45	13.7	1/4	6	60	18.2	x	x	x	x	x
55	16.7	60	18.2	1/4	6	75	22.8	-	x	-	x	x

5PTC20 Performance Ratings [2]

	Boom Position	Load Rating		Hook Reach		Hook Height	
		(lb)	(kg)	(in)	(mm)	(in)	(mm)
BLUE RANGE	A-1	1100	500	46	1168	43	1092
	A-2	1100	500	58	1473	43	1092
	A-3	1100	500	70	1778	43	1092
	A-4	1100	500	82	2082	43	1092
GREEN RANGE	B-1	1100	500	37	939	61	1549
	B-2	1100	500	48	1219	67	1701
	B-3	1100	500	58	1473	72	1828
	B-4	1100	500	69	1752	78	1981
	C-1	1100	500	28	711	71	1803
	C-2	1100	500	36	914	80	2032
	C-3	1100	500	45	1143	88	2235
	C-4	1100	500	53	1346	97	2463



[1] Lift below floor level varies depending on boom position and base configuration. For longer lifts, including use with two-part lines kits, please contact factory.

[2] Performance Characteristics are for standard products referred to in this manual. Non-standard products may vary from the original design. Contact Thern, Inc. for this information.

[3] Wire rope assemblies include a hook and a swaged ball fitting to work with quick disconnect anchor on the winch.

Thern
Winches & Cranes

Thern, Incorporated
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Winona, MN 55987

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Thern Europe
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Griffco Valve Inc.
188 Creekside Dr
Amherst, NY 14228 USA
Phone: +1 716 835-0891
Fax: +1 716 835-0893
sales@griffcovalve.com
www.griffcovalve.com

G-SERIES
BACK PRESSURE VALVES

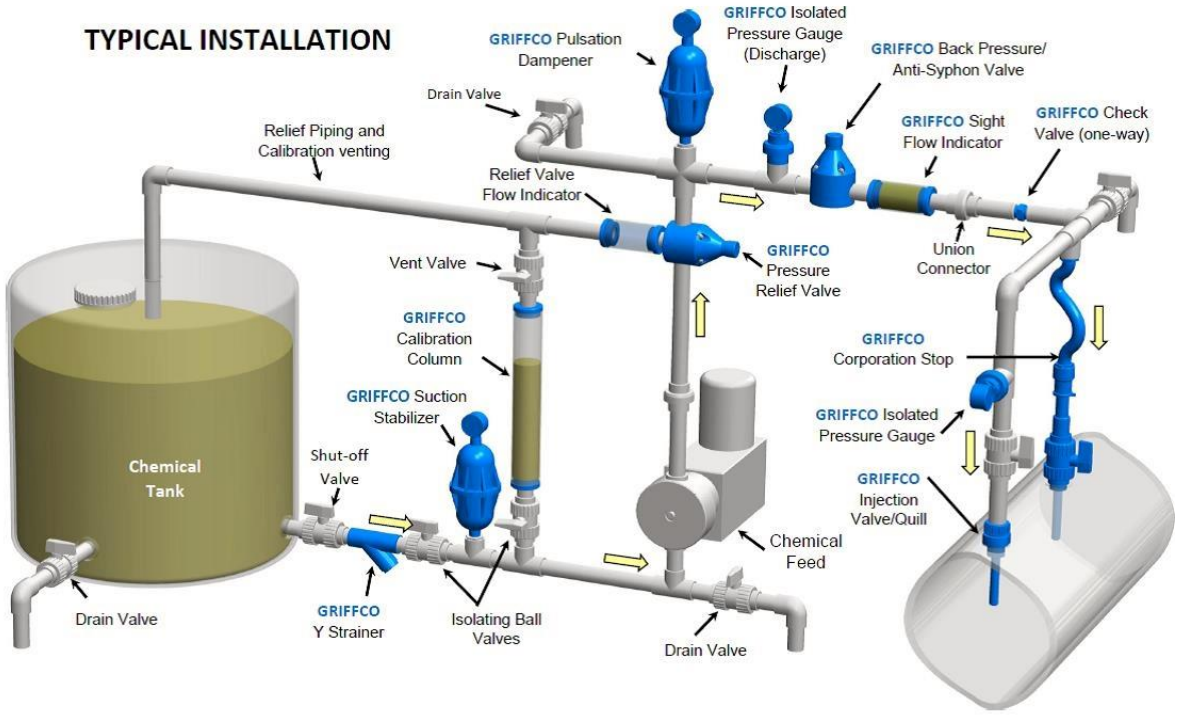
Griffco G-Series diaphragm back pressure valves are designed to enhance the performance of chemical feed systems by applying a continuous back pressure to the chemical feed pump, while also acting as an anti-syphon valve. Robust construction ensures reliability in the rigorous service of municipal and industrial applications. Wetted materials include: **PVC, CPVC, PP, PVDF, PTFE, Halar, 316 SS, A20 and Hast. C**. Available sizes: 1/2" – 4".

Features:

- **Molded Noryl Top**
- **High Reliability/Low Cost**
- **Molded PTFE/EPDM Diaphragm**
- **Adjustable Relief Settings**
- **Optional Pressure Rated Valves**
- **Anti-Siphon Function**
- **Robust, Machined Construction**
- **Tamper Resistant Adjustment Screw**
- **Wide Range of Materials**

Operation:

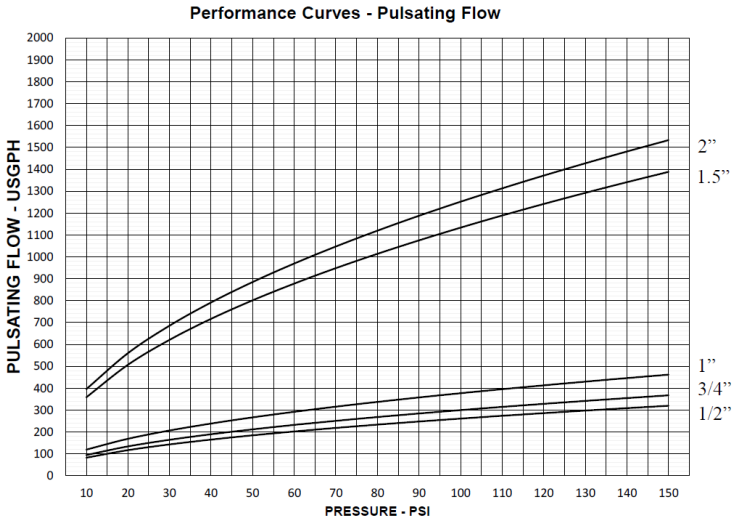
Griffco diaphragm back pressure valves apply positive discharge pressure to a metering pump system to prevent siphoning and eliminate varying dosage rates caused by fluctuating downstream pressure. The diaphragm is held against the valve seat by an internal spring. When the preset pressure is exceeded, the diaphragm is forced up and chemical flows through the valve to the injection point. The valves are preset for 50 psi, however they are field adjustable from 10 - 150 psi via the adjustment screw. Installation should be as close to the injection point as possible to prevent chemical line drainage and it is most important that all chemical system equipment such as pulsation dampeners and pressure gauges are between the pump and back pressure valve.



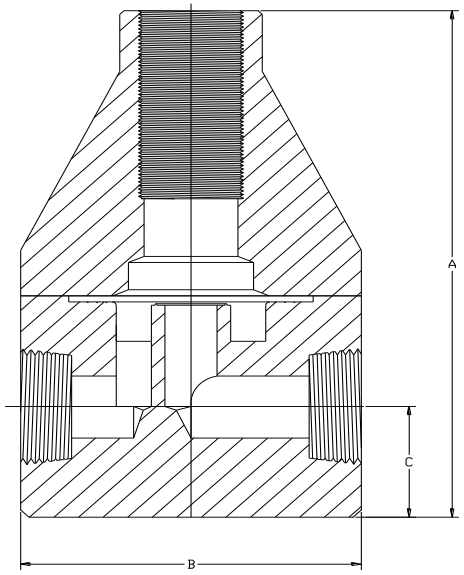
Technical Data:

Model BPG Sizes			**1/2", 3/4", 1", 1 1/2", 2", 3", 4"**		
Connections:			**NPT, Socket, Union, Flange**		
Pressure Adjustment			**Standard: 10 - 150 psi; Optional: 0 – 50 psi, 10 – 250 psi, 50 - 350 psi** ***Note: Size 1 1/2" and Larger BPG valves 10 – 250 psi Max range ONLY.**		
Flow Rates @ 150 psi			**Shipping Weight: lbs**		
Size	**Pulsating**	**Continuous**	**Plastic**	**Metal / Plastic Top**	**Metal / Metal Top**
1/2"	**320 USgph**	**16.7 USgpm**	**3.0**	**5.5**	**6.5**
3/4"	**367 USgph**	**19.2 USgpm**	**3.0**	**5.5**	**6.5**
1"	**462 USgph**	**24.2 USgpm**	**3.5**	**6.0**	**7.0**
1 1/2"	**1388 USgph**	**72.7 USgpm**	**9.0**	**18.5**	**26.0**
2"	**1533 USgph**	**80.3 USgpm**	**9.0**	**20.0**	**30.0**
3"	**5157 USgph**	**270 USgpm**	**28.0**		
4"	**5157 USgph**	**270 USgpm**	**30.0**		
Max Temperature: (°F)			**PVC: 140°; CPVC & PP: 195°; PTFE, PVDF & Metal: 300°, (Peak 390°)**		
Max Operating Pressure(psi) @ 70 Deg. F			**Plastic/Noryl: 375 psi**	**Metal/Metal: 2000 psi**	
Materials of Construction:					
Diaphragm			**PTFE / EPDM, Optional: Viton, Hypalon, & PTFE / Viton**		
Valve Top			**Standard: 1/2" – 2" Noryl 3" & 4" PVC Optional: 316 SS**		
Valve Body			**PVC, CPVC, PP, PTFE, PVDF, Halar, 316 SS, A 20, Hast. C**		

Performance Curves: (3" & 4" curves on request)



Dimensions:



Product Codes For Ordering Back Pressure Valves:

BPG ☐☐☐ ☐ ☐ ☐

1 2 3 4

1 = Size	**2 = Material**	**3 = Spring Opt**	**4 = Options**
050 - 1/2"	P - PVC	Blank - 10-150 psi	Blank- NPT, PTFE/EPDM
075 - 3/4"	CP - CPVC	1 - 0 - 50 psi	V - Viton Diaphragm
100 - 1"	PP - Polypro	2 - 10 - 250 psi	TV - PTFE/Viton Diaph.
155 - 1 1/2"	T - PTFE		S - Socket Connection
200 - 2"	K - PVDF	*For 50-350 psi*	F - Flange Connection
300 - 3"	H - Halar	*spring use option*	U - Union Connection
400 - 4"	S - 316 SS	*code "MSS"*	OSS - 316 SS Top
	A - Alloy 20		MSS - 50 - 350 psi
	C - Hastelloy C		AR - Priming Valve
			90 - 90° Configuration

Note: Option MSS only for use with 316SS, A20 & Hast C. valves.

DIMENSIONS: BPG - Series				
All Materials (See Note below for 4" PVC & CPVC)				
Size	A (in.)	B (in.)	C (in.)	Orifice (in.)
1/2"	5.560	3.500	1.125	0.375
3/4"	5.560	3.500	1.125	0.375
1"	5.860	3.500	1.250	0.437
1.5"	8.350	4.90	1.825	0.750
2"	8.900	4.90	2.150	0.875
3" *	11.25	15.0 *	3.0	1.500
4" * **	11.25	15.0 **	3.0	1.500

* Note 3" & 4" are flanged only ** B Dim on 4" PVC & CPVC is 17"

Email: sales@griffcovalve.com **Website: www.griffcovalve.com**

Griffco Valve Inc.
6010 N. Bailey Ave., Suite 1B
Amherst, NY 14226
Phone: 1 716 835-0891
Fax: 1 716 835-0893

G-Series Instruction Manual

Back Pressure Valves
Pressure Relief Valves

Call: 1 - 800 - GRIFFCO **Website: www griffcovalve.com**

INSG-2002-R0408 Revision Date: 06/23/09

INTRODUCTION

GRIFFCO diaphragm back pressure valves are used to enhance the performance of chemical feed pumps and systems by providing a constant discharge head pressure. These valves also function as an anti-siphon valve. The diaphragm is held against the seat by the internal spring. Back pressure is adjustable from 10 - 150 psi via the adjustment screw. When the inlet pressure exceeds the preset pressure the diaphragm lifts off the seat and the chemical flows to the injection point. After each discharge stroke of the pump, as the pressure drops, the diaphragm reseats itself.

GRIFFCO diaphragm pressure relief valves are designed to protect chemical feed pumps and systems from overpressure caused by defective equipment or blockages in the chemical line. The 3 port design allows chemical to flow through the valve via an internal chamber. When the pressure in the chemical line exceeds the preset pressure of the valve the diaphragm lifts off the seat and the chemical then flows out the bottom port back to the chemical tank. Relief pressure is adjustable via the adjustment screw in the top of the valve.

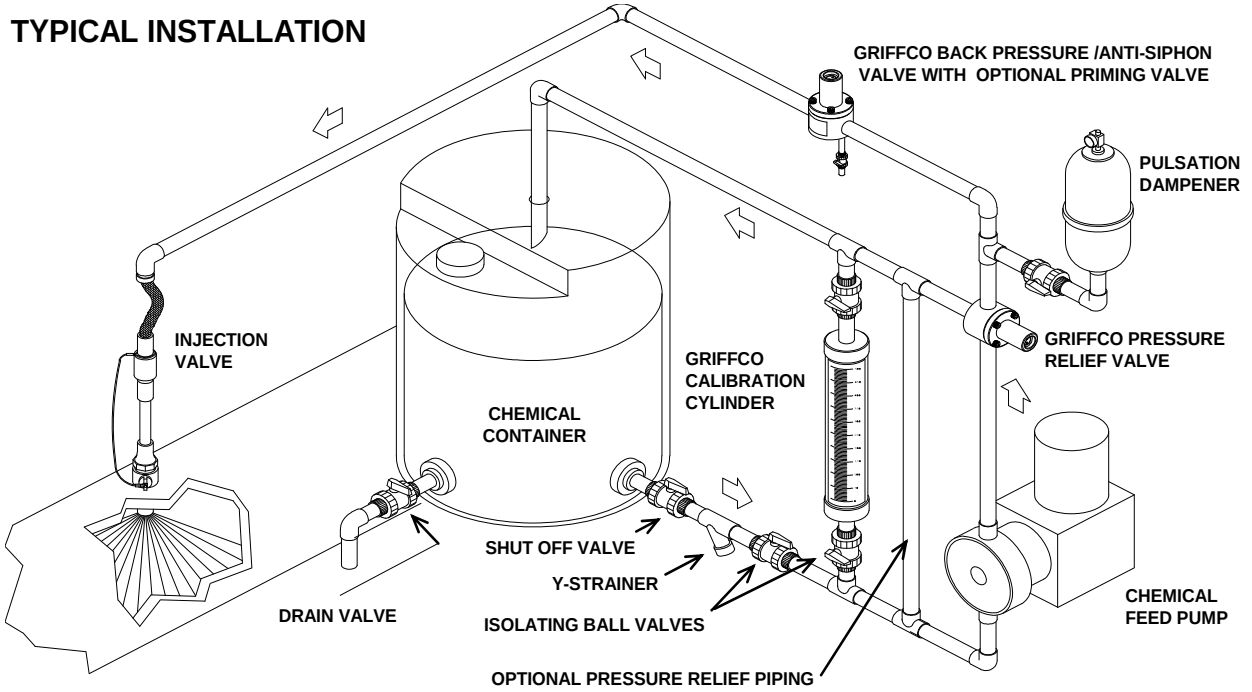
Back Pressure Valve:
Generally, the back pressure valve can be installed anywhere in the discharge line, provided there is some downstream pressure at the dosage point. If there is no downstream pressure the back pressure valve should be installed at the dosage point to prevent siphoning and drainage of the chemical line. The valve can be installed either vertically or horizontally. All **GRIFFCO** valves are factory set at 50 psi, unless otherwise specified. Field adjustment is possible with the adjustment screw.

Back pressure valve performance will be enhanced with the installation of a pulsation dampener to smooth out the discharge / suction cycles of the pump. Thus, the diaphragm is free to float inside the valve chamber, minimizing the wear on the stress points of the diaphragm. Pulsation dampeners will also reduce the pressure drop across the valve by reducing peak flows. Backpressure valves should be installed downstream of the dampener. For most applications diaphragm type dampeners are required. Generally speaking 5 to 10% dampening is sufficient. Consult with your pump manufacturer to get his recommendations.

Pressure Relief Valve:
Installation should be made as close to the chemical pump discharge valve as possible, without any equipment, especially shut-off valves, between the valve and the pump. Direction of flow must be across the valve, however the side of entry is not important. The valve can be installed either vertically or horizontally. All **GRIFFCO** valves are factory set at 50 psi, however field adjustment is possible with the adjustment screw.

The optimum installation for the relief valve is to vent the relief port back to the chemical tank, or directly to a containment area. However if this is not possible, the relief port can be piped back into the suction side of the pump. This will apply the suction head to the relief port. To compensate, divide the NPSH by 4 and add this pressure to the relief valve setting. Do not put a shut off valve in the relief line.

TYPICAL INSTALLATION



MAINTENANCE:

The pressure relief and back pressure valves were designed with minimizing the amount of maintenance required to keep the valves in operation. However, periodic replacement of the diaphragm is required. A parts kit can be purchased from your local Griffco Valve distributor. To facilitate inspection and replacement, the valve layout is such that removal of the diaphragm can be done without taking the valve out of the chemical line.

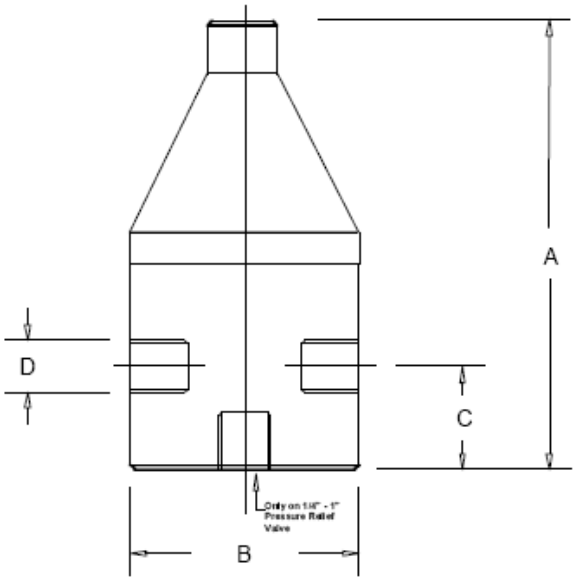
Caution: Ensure the system is not under pressure and that the chemical lines are flushed with water before disassembly.

Unscrew the pressure adjustment screw to remove the pressure from the diaphragm. Remove the 4 bolts and lift off the valve top.

After the diaphragm and the valve seat have been inspected and replaced if necessary, (White PTFE side down), check the adjustment spring. Make sure there is no rust or corrosion. Place the support disc the spring onto the valve body and slide the top back over the four bolts.

Tighten the 4 bolts, and then replace the adjustment screw. Turn the adjustment screw clockwise to approximately the same position as it was prior to disassembly. If an exact pressure setting is required or a different pressure is desired a pressure gauge should be used to verify the setting. Turning the adjustment screw clockwise will increase pressure.

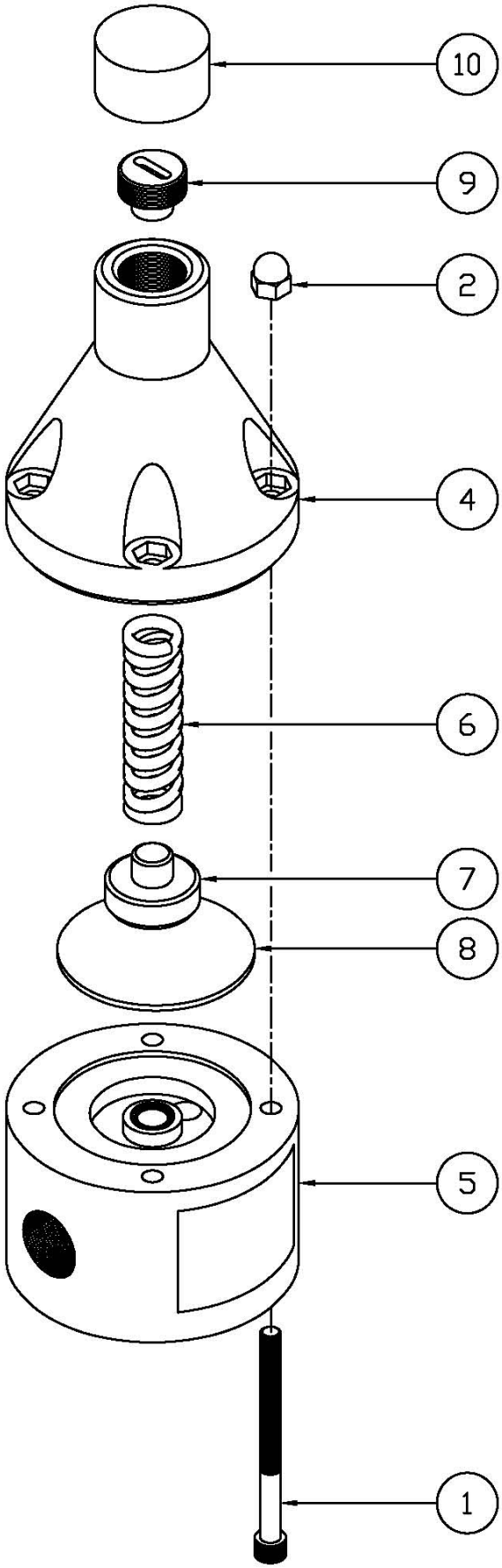
DIMENSIONS:



D	A (in)	B (in)	C (in)
1/2”	5.56	3.50	1.125
3/4”	5.56	3.50	1.125
1”	5.86	3.50	1.250
1 1/2”	8.35	4.90	1.825
2”	8.90	4.90	2.15

Warranty: **GRIFFCO** Valve, Inc. warrants its products against defects in workmanship and materials for one year under normal use or 18 months from date of shipment whichever occurs first. All obligations and liabilities under this warranty are limited to repair or replacement (at our option), FOB our plant such allegedly defective units as are returned to our factory transport prepaid. Repairs or replacements are made subject to inspection of returned items.
This warranty does not extend to damage by corrosion or erosion. The materials of construction offered are recommendations subject in all cases to acceptance by the customer. These recommendations, based on previous experience and best available information, do not constitute guarantees against wear or chemical action. Expressly excluded from this warranty are defects caused by misuse, abuse or improper application, installation or operation of the unit. No liability for consequential damages or reinstallation labor is accepted. **GRIFFCO** Valve, Inc. will not assume responsibility for contingent liability for alleged failure of its products.

PARTS LIST



ITEM	DESCRIPTION	BPV #	PART #
1	1/4 - 20 X 2 3/4" Bolt - 1/2 - 1" Plastic Valves		PV-00101
	5/16 - 18 X 1 1/2" Bolt - 1 1/2" - 2" Metal Valves		PV-00102
	1/4 - 20 X 4.5" - 1 1/2" Plastic Valves (5" OD Body)		PV-00104
	1/4 - 20 X 5" Bolt - 1 1/2" (OBS 4.5" OD); & 2" Plastic Valves (5" OD)		PV-00105
	1/4 - 20 X 1 1/4" Bolt - 1/2 - 1" Metal Valves		PV-00108
2	1/4 - 20 Cap hex nut		PV-00202
3	1/4 Flat Washer (Required with 316 SS Top)		PV-00302
	5/16 Flat washer (Required with 316 SS Top)		PV-00303
4	1/2" - 1" Valve Top – Noryl. Black		PV-004451
	1/2" - 1" Valve Top – Noryl, Orange		PV-004452
	1/2" - 1" Valve Top – Noryl, Yellow		PV-004053
	1/2" - 1" Valve Top – Noryl, Green		PV-004054
	1/2" - 1" Valve Top – Noryl, Grey		PV-004450
	1/2" - 1" Valve Top - 316 SS		PV-00407
	1 1/2" Valve Top; 4 ½" Valves, PVC		PV-00411
	1 1/2" Valve Top; 4 ½" Valves. 316 SS		PV-00413
	2" Valve Top; 5" Valves, PVC		PV-00414
	2" Valve Top; 5" Valves. 316 SS		PV-00416
		BPV #	**PRV #**
5	1/2" Valve Body PVC	BPV-00511	PRV-00511
	1/2" Valve Body PP	BPV-00512	PRV-00512
	1/2" Valve Body PTFE	BPV-00513	PRV-00513
	1/2" Valve Body PVDF	BPV-00514	PRV-00514
	1/2" Valve Body 316 SS	BPV-00515	PRV-00515
	1/2" Valve Body Alloy 20	BPV-00516	PRV-00516
	1/2" Valve Body Hast C	BPV-00517	PRV-00517
	1/2" Valve Body CPVC	BPV-00518	PRV-00518
	3/4" Valve Body PVC	BPV-00521	PRV-00521
	3/4" Valve Body PP	BPV-00522	PRV-00522
	3/4" Valve Body PTFE	BPV-00523	PRV-00523
	3/4" Valve Body PVDF	BPV-00524	PRV-00524
	3/4" Valve Body 316 SS	BPV-00525	PRV-00525
	3/4" Valve Body Alloy 20	BPV-00526	PRV-00526
	3/4" Valve Body Hast C	BPV-00527	PRV-00527
	3/4" Valve Body CPVC	BPV-00528	PRV-00528
	1" Valve Body PVC	BPV-00531	PRV-00531
	1" Valve Body PP	BPV-00532	PRV-00532
	1" Valve Body PTFE	BPV-00533	PRV-00533
	1" Valve Body PVDF	BPV-00534	PRV-00534
	1" Valve Body 316 SS	BPV-00535	PRV-00535
	1" Valve Body Alloy 20	BPV-00536	PRV-00536
	1" Valve Body Hast C	BPV-00537	PRV-00537
	1" Valve Body CPVC	BPV-00538	PRV-00538
	1 1/2" Valve Body PVC (5" OD)	BPV-50541	PRV-50541
	1 1/2" Valve Body PP (5" OD)	BPV-50542	PRV-50542
	1 1/2" Valve Body PTFE (5" OD)	BPV-50543	PRV-50543
	1 1/2" Valve Body PVDF (5" OD)	BPV-50544	PRV-50544
	1 1/2" Valve Body 316 SS (5" OD)	BPV-50545	PRV-50545
	1 1/2" Valve Body Alloy 20 (5" OD)	BPV-50546	PRV-50546
	1 1/2" Valve Body Hast C (5" OD)	BPV-50547	PRV-50547
	1 1/2" Valve Body CPVC (5" OD)	BPV-50548	PRV-50548
	2" Valve Body PVC	BPV-00551	PRV-00551
	2" Valve Body PP	BPV-00552	PRV-00552
	2" Valve Body PTFE	BPV-00553	PRV-00553
	2" Valve Body PVDF	BPV-00554	PRV-00554
	2" Valve Body 316 SS	BPV-00555	PRV-00555
	2" Valve Body Alloy 20	BPV-00556	PRV-00556
	2" Valve Body Hast C	BPV-00557	PRV-00557
	2" Valve Body CPVC	BPV-00558	PRV-00558
6	Pressure Spring - 1/2" - 1" Valve; 150 psi		PV-00602
	Pressure Spring - 1/2" - 1" Valve; 50 psi		PV-006021
	Pressure Spring - 1/2" - 1" Valve; 250 psi		PV-006023
	Pressure Spring - 1/2" - 1" Valve; 350 psi		PV-006122
	Pressure Spring - 1/2" - 1" Valve; 100 psi, 316 SS		PV-00602S
	Pressure Spring - 1 1/2" - 2" Valve; 150 psi		PV-00603
	Pressure Spring - 1 1/2" - 2" Valve; 350 psi		PV006031
	Pressure Spring - 1 1/2" - 2" Valve; 50 psi		PV006033
7	Support Disc - 1/2 - 1" Valve, PVC		PV-00705
	Support Disc - 1/2 - 1" Valve, 316 SS		PV-00706
	Support Disc - 11/2" - 2" Valve, PVC		PV-00708
	Support Disc - 11/2" - 2" Valve, 316 SS		PV-00709
8	Diaphragm - 1/2" - 1" Valve - PTFE / EPDM		PV-00810
	Diaphragm - 1/2" - 1" Valve – Viton		PV-00812
	Diaphragm - 1/2" - 1" Valve - PTFE / Viton (High Temperature)		PV-00813
	Diaphragm - 1 1/2" Valve - PTFE / EPDM (OBS 4.5" OD Body)		PV-00820
	Diaphragm - 1 1/2" Valve – Viton (OBS 4.5" OD Body)		PV-00821
	Diaphragm - 1 1/2" Valve – PTFE/Viton (OBS 4.5" OD Body)		PV-00822
	Diaphragm - 1 1/2" - 2" Valve – PTFE/EPDM (5" OD Body)		PV-00830
	Diaphragm - 1 1/2" - 2" Valve – Viton (5" OD Body)		PV-00831
9	Adjustment Screw - 1/2" - 1" Valve PET (white)		PV-00906
	Adjustment Screw - 1/2" - 1" Valve Coated Steel		PV-00903
	Adjustment Screw - 1 1/2" - 2" Valve PVC		PV-00920
	Adjustment Screw - 1 1/2" - 2" Valve Coated Steel		PV-00921
10	Protective Vinyl Cap- 1/4" – 1" Valves		PV-01001
	Protective Vinyl Cap- 1 1/2" – 2" Valves		PV-01002

SECTION 5

FINAL INSPECTION REPORTS

5.1

number	title	ProMinent	
P3304 A01	FINAL INSPECTION REPORT SYSTEM MECHANICAL FORM		
Revision Level & date. R3 Sept 23, 2021	Printed copies are uncontrolled and for reference purposes only	standard WI	page / of 1/3

PFC S/D#:	3021800334	**Serial Number:**	2021322434	**Date**	3/24/2022
Customer:	HART ENGINEERING CORPORATION	**Location:**			
Cust P/O#:	9900.109	**Equipment Number:**			

SYSTEM IDENTIFICATION

ProMinent Fluid Controls, Inc.
136 Industry Drive
Pittsburgh, PA 15275
Phone: (412) 787-2484
Fax: (412) 787-0704
Web: www.prominent.us 03/24/2022

PART NO. UL000010
Promix SMS-5HP_460V_Bridge
SERIAL NO. 2021322434

SPECIFICATIONS INSPECTION		
1.1	Assembly checked against customer order	☑
1.2	Assembly checked against project drawing	☑
1.3	All pumps, monitors, and accessories are installed as specified	☑
1.4	All pipes and fittings are correct diameter and thread size	☑
	Liquid Inlet port: Size: __N/A___ Type: ___N/A___ Outlet port: Size: __N/A___ Type: __N/A____ **Pneumatic** Inlet Port: Size _____ Type _____ Outlet port: Size _____ Type _____ i.e. ½ ", 1", NPT, Flange, etc.	
1.5	All joints and connections are sealed with specified type sealant	☑
1.6	All tagging installed where required.	☑
PHYSICAL/STRUCTURAL INSPECTION		
2.1	All valves contain seals and O-rings	☑
2.2	All flow dependent devices are oriented in operational direction of flow	☑
2.3	No stress on any installed PVC flow monitors	☐
2.4	All devices functionally tested	☑
2.5	System has been pressure tested for leaks	☑
2.6	No sharp edges	☑
2.7	No excessive pipe wrench marks on pipes or fittings	☑

Prominent Fluid Controls, Inc
RIDC Park West
136 Industry Drive
Pittsburgh, PA 15275
Tel: 412-787-2484
Fax: 412-787-0704

2.8	All coatings have smooth, even finish	☐
2.9	All piping components securely supported	☑
2.10	All fasteners are tight	☑
VESSEL INSPECTION		
3.1	All flanges and nozzles square with vessel centerlines when applicable	☐
3.2	Compatible flange gaskets included when applicable	☐
3.3	Vessel clean inside and out of all debris and markings when applicable	☐
3.4	Water or air tested for no leaks when applicable	☐
DOCUMENTATION INSPECTION		
4.1	As-built information documented	☑
4.2	Hydrostatic Test Report complete (attach if applicable)	☐
4.3	Electrical Test Report complete (attach if applicable)	☑
4.4	Instruction Manual(s)/ customer documentation complete	☑
4.5	Spare Parts List complete	☑
4.6	Note of Delivery complete	☑
4.7	System photographically recorded	☑
SYSTEM SPECIFIC		
S1	All inlet/outlet ports labeled	☐
S1	ProMinent/other logos as required	☐
ADDITIONAL INFORMATION		
SMS 5HP CONTROL PANEL 460V SHIP LOOSE		

REPORT CERTIFICATION

Production		Production QC	
Date: 3/24/2022 Time:	Signature: TS	Date: 3-24-22 Time: 1:05	Signature: RIm

Prominent Fluid Controls, Inc
RIDC Park West
136 Industry Drive
Pittsburgh, PA 15275
Tel: 412-787-2484
Fax: 412-787-0704

Prominent Fluid Controls, Inc
RIDC Park West
136 Industry Drive
Pittsburgh, PA 15275
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Fax: 412-787-0704

number	title	ProMinent
P3344 A01	PROMIX SMS TEST FORM	
Revision Level & date. R1 Feb 2020	Printed copies are uncontrolled and for reference purposes only	standard WI / page of 1/1

Customer: **HART ENGINEERING COPORATION**	
Project:	Spec Section:
Customer's PO: **9900.109**	
PFC Order #: **3021800334**	Network #: **1101338**
Part Number: **1102745**	Induction-Type Rapid Mixing (ProMix SMS)
Serial Number(s): **2021322434**	Set-up: SMS mounted in tank

Visual:

☒ All components checked against order

☒ Assembly checked against project drawing

☒ All tagging installed where required

☒ All flow dependent devices are oriented in operational direction of flow

Plumbing:

☒ All pipes and fittings are correct diameter and thread size

☒ All joints and connections are sealed with specified type sealant

Electrical:

☒ Correct voltage electrical power is provided to all circuit breaker supply points & is functional

☒ All pumps, motors & controllers that require power are electrically tested

☒ If applicable, all control wiring to/from customer SCADA, DCS, or PLC is connected properly

Functional:

☒ Verify that there are no Abnormal Vibrations or Acoustical Anomalies during 15 min run-test

☒ Test motor amp-draw with clamp-on Amp Meter during 15 min run-test (no surges permitted)

☒ Performance meets PFC specifications

Comments:

Name: **TS** Date: **03-09-2022**

number	title	
P3336	FINAL INSPECTION REPORT SYSTEMS ELECTRICAL	**ProMinent**
Revision Level & date. R1 October 3, 2018	Printed copies are uncontrolled and for reference purposes only	standard WI / page / of 1/2

Date: 3/9/2022	
PFC S/D#: 3021800334	**Serial #: 2021322445 UL #: D 53435382**
Customer: HART ENGINEERING CORPORATION	**Location:**
Cust P/O: 9900.109	**Equipment #:**

SPECIFICATIONS INSPECTION		
1.1	Assembly checked against customer order	☒
1.2	Assembly checked against project drawing	☒
1.3	Panel layout correct	☒
1.4	Name tags correct and straight	☒
1.5	Panel paint correct and good condition	☒
PHYSICAL / STRUCTURAL INSPECTION		
2.1	All components tight in cabinet	☒
2.2	All components tight in door	☒
2.3	All terminal connections tight	☒
2.4	All ground connections tight	☒
2.5	All wiring straight and tied	☒
2.6	All coatings have smooth, even finish	☒
2.7	All fasteners are tight	☒
2.8	All exposed fastener threads exceeding three (3) to be trimmed and filed	☒
2.9	Panel clean inside and out of all debris and markings	☒
2.10	No sharp edges	☒
ELECTRICAL INSPECTION		
3.1	Ring out point to point	☒
3.2	Power applied **480** Voltage **AC** DC	☒
3.3	All components functional in cabinet	☒
3.4	All components functional in door	☒
3.5	PLC programming correct and functioning properly	☐
3.6	Drive functioning properly	☐
3.7	Motor rotation correct	☒
3.8	Instrumentation functioning properly	☒
3.9	Special components functioning properly	☒
3.10	Operation of all circuits tested	☒
3.11	Calibration complete	☒
DOCUMENTATION INSPECTION		
4.1	As-built information documented	☒
4.2	Functional description of system operation documented	☒

4.3	Spare Parts List complete	☒
4.4	Instruction Manual(s) complete	☒
4.5	All customer required documentation enclosed	☒
4.6	Drawing shipped with panel	☒
4.7	Copy of inspection report in panel	☒
4.8	Note of Delivery complete	☒

ADDITIONAL INFORMATION

	SMS SYSTEM

REPORT CERTIFICATION

Panel Test and Check-out

Name: TS **Date:3/9/2022**

ProMinent Fluid Controls, Inc.
136 Industry Drive
Pittsburgh, PA 15275
Phone: (412) 787-2484
Fax: (412) 787-0704
Web: www.prominent.us 03/09/2022

PART NO. SW000000
SMS_5HP_Control Panel_460V
SERIAL NO. 2021322435