7.5 HP Electric Duplex Reciprocating Compressor

Owners Manual

Introduction. Congratulations on the purchase of your new air compressor. The air compressor is precision built from the finest materials using the finest state of the art design, and high tech engineering available today. Quality, performance and trouble free operation will assure you a dependable supply of air power on demand

Check www.compressed-air-systems.com for most up to date manual and compressor service and technical information

CAUTION READ THIS MANUAL CAREFULLY before operating or servicing this air compressor, to familiarize yourself with the proper safety, operation, and standard operating procedures of this unit. **FAILURE TO COMPLY WITH INSTRUCTIONS IN THIS MANUAL COULD RESULT IN THE VOIDING OF YOUR WARRANTY, AND PERSONAL INJURY, AND/OR PROPERTY DAMAGE. THE MANUFACTURER OF THIS AIR COMPRESSOR WILL NOT BE LIABLE FOR ANY DAMAGE BECAUSE OF FAILURE TO FOLLOW THE INSTRUCTIONS IN THIS MANUAL**. By following the instructions and recommendations in this manual you will ensure a longer and safer service life of your air compressor.

If you have questions or need clarification about this manual or your compressor call 800-531-9656

Do not operate compressor outdoors in wet weather

Industrial Gold
Quality Air Compressor at a Great Price.

industrialgold.com ▪ 1-800-531-9656 ▪ Fax 972-352-6364

WARNING: **Read all installation steps in install guide, and compressor package manual prior to un-crating or installing compressor package. Failure to do so can result in personal injury or damage to compressor package.**

NOTICE: **All compressor air receivers should be inspected by a certified pressure vessel technician at least once per year, to check for leaks, weak points in the metal or any other deformity of the air receiver. If at any time a receiver appears out of conformance with ASME/CRN certification or a deformity is believed to have developed no matter how minor it may appear the tank should be locked out of service immediately and replaced with a certified ASME/CRN certified air receiver immediately before the compressor can be put back into service. The receivers should have a general inspection weekly as part of normal service.**

SAFETY PRECAUTIONS AND WARNINGS

Listed are some, but not all safety precautions that must be observed with compressors and compressed air systems. Failure to follow any of these warnings may result in severe personal injury, death, property damage and/or compressor damage.

Air from this compressor will cause severe injury or death if used for breathing or food processing. Air used for these processes must meet OSHA 29 CFR 1910 or FDA 21 178.3570 regulations.

This compressor is designed for use in the compression of normal atmospheric air only. No other gases, vapors or fumes should be exposed to the compressor intake, nor processed through the compressor.

Disconnect all power supplies to the compressor plus any remote controllers prior to servicing the unit.

Relieve all pressure internal to the compressor prior to servicing.

Do not depend on check valves to hold system pressure.

A properly sized safety valve must be installed in the discharge piping ahead (upstream) of any shut-off valve (block valve), heat exchanger, orifice or any potential blockage point. Failure to install a safety relief valve could result in rupturing or explosion of some compressor or safety component.

Do not change the pressure setting of the safety relief valve, restrict the function of the safety relief valve, or replace the safety valve with a plug.

Over pressurization of some system or compressor component can occur, resulting in severe personal injury, death and property damage.

Never use plastic pipe, rubber hose, or soldered joints in any part of the compressed air system. Failure to ensure system compatibility with compressor piping is dangerously unsound.

Never use a flammable or toxic solvent for cleaning the air filter or any parts.

Do not attempt to service any part while the compressor is operating.

Do not operate the compressor at pressures in excess of its rating.

Do not remove any guards while the compressor is operating.

Observe gauges daily to ensure compressor is operating properly.

Follow all maintenance procedures and check all safety devices on schedule.

Compressed air is dangerous, do not play with it.

Use the correct lubricant at all times.

Always wear proper safety equipment when using compressed air.

Always install compressor to all local applicable electric codes.

WARNING: Always wear proper protective eye ware, hearing protection and safety clothing when working around the compressor package. No loose or baggy clothing should be worn around compressor package at any time.

WARNING: On Electric motor powered air compressors make sure electrical system is up to National Electric Code (NEC) prior to installing compressor system. Failure to install a compressor with a proper NEC electrical system can cause personal injury, compressor package damage and void compressor package warranty

NOTICE: To ensure full compressor tank warranty all tank mounted compressor packages must be mounted on factory approved vibration isolation pads. A compressor should NEVER be installed while still on or in its original packaging. Failure to properly install the compressor system with approved vibration isolation pads will result in the compressor tank warranty being void.

WARNING: Compressed Air Systems compressors can operate at pressures from 0-250psi depending on the compressor package design and build specifications. Always verify that the system the compressor is installed into can handle the maximum operational pressure the compressor. NEVER install a compressor in a system that can not handle the compressors maximum operating pressure.

WARNING: Compressed air is extremely dangerous when not properly used or installed. Always make sure a trained compressed air professional has looked over the air system prior to use. Improper installation or use of compressed air can cause bodily injury or death. NEVER pressurize an object that was not designed to be pressurized. Pressurizing objects not properly engineered for the maximum operating pressure of the compressor system can cause bodily injury or death.

WARNING: Never apply air pressure to compressor crank case, always make sure crank case vent is clear and free from obstructions. Adding pressure to the crank case can cause serious bodily injury or death.

WARNING: Never operate a compressor in a moving vehicle or towable object in motion. Doing so can damage the compressor, compressor drive components, or auxiliary parts on the compressor package. Operating the compressor in a moving vehicle or towable object can cause serious bodily injury or death.

WARNING: Check function of safety valves, weekly to insure proper function, replace immediately if faulty or damaged.

WARNING: (Compressors Packaged with NEMA 7 Components)

Compressed Air Systems, LLC certifies that the electric motor, electrical enclosure and electrical conduit are rated for NEMA7/hazardous locations. (Only for applicable packages with NEMA7 added components)

Air compressors have multiple moving parts and potential points of contact that could create an ignition source. The compressor pumps are manufactured with ferrous metals and in some cases multiple moving parts can come in contact with one another causing an ignition source. Compressed Air Systems LLC does not guarantee this will not occur. Lack of maintenance or care can result in conditions that could also cause ignition sources.
Compressed Air Systems, LLC only guarantees that the electric motor, electrical enclosure and electrical conduit are rated for NEMA7 hazardous location. Compressed Air Systems LLC accept no other responsibility for the rating of the package.

Troubleshooting Chart

NOTE: Troubleshooting problems may have similar causes and solutions

You should always contact an authorized service center before attempting to fix or repair your air compressor.

Always make sure electrical power is off before removing any inspection covers or plates or before servicing compressor.

Problem	Possible causes	Solutions
Breaker trips	Low Voltage supply Motor overloads tripped Restricted air passages Loose wires at contact points Seized Pump	Check that incoming power wire size is adequate for compressor Check that compressor is on dedicated circuit Adjust belt tension Check wire connections to make sure they are tight Inspect transfer tubes and, check valve
Compressor stalls	Low voltage supply to compressor Loose compressor belts Bad check valve Seized compressor pump	Check compressor power supply for adequate breaker and wire size Inspect check valve for proper operation Tighten belts Check compressor for proper oil level
Low discharge pressure	Air leaks in shop Leaking valves Restricted air intake Blown gaskets/seals Worn piston rings or cylinder	Tighten or replace leaking fittings, or joints Clean or replace air filter
Compressor pump knocking	Loose motor pulley or compressor flywheel Low oil level in compressor pump Carbon build up on valve and piston	Tighten pulley or flywheel Keep oil level at recommended level for proper operation Only use factory recommended oil

Troubleshooting Chart (continued)

NOTE: Troubleshooting problems may have similar causes and solutions

You should always contact an authorized service center before attempting to fix or repair your air compressor.

Always make sure electrical power is off before removing any inspection covers or plates or before servicing compressor.

Problem	Possible causes	Solutions
Excessive oil discharge in air (All Compressors have a small amount of oil carry over in compression	Worn piston rings or cylinder Restricted air intake Oil level to high Compressor has exceeded it duty cycle	Clean or replace air filters Reduce oil level to recommended amount Reduce compressor duty cycle (repair leaks or add another unit to handle the excess demand)
Compressor overheating	Poor ventilation Dirty cooling surfaces Compressor is out of its operating duty cycle	Relocate compressor to any area with better ventilation (at least 18 inches from the nearest wall) Clean all cooling surfaces Reduce compressor duty cycle (repair leaks or add another unit to handle the excess demand)
Excessive belt wear	Pulley out of alignment Improper belt tension Pulley damaged of loose	Realign pulley with flywheel Re adjust belt tension
Compressor won't start in cold weather	Bad check valve Compressor has wrong grade oil Control lines frozen	Use IS 100 (30W) compressor oil for cold weather conditions Move compressor to a warmer location Put a heat lamp on compressor to maintain above freezing temperatures

Troubleshooting Chart (continued)

NOTE: Troubleshooting problems may have similar causes and solutions

You should always contact an authorized service center before attempting to fix or repair your air compressor.

Always make sure electrical power is off before removing any inspection covers or plates or before servicing compressor.

Problem	Possible causes	Solutions
Compressor Motor Hums won't start	Fuse or Breaker blown in main panel (or fuse in fused disconnect if applicable) Low voltage to compressor Compressor starting with head pressure Power leads in motor or magnetic starter loose Starter or Pressure switch contacts corroded or broken	Re-set breaker or replace blown fuse Inspect check valve for proper operation Check all power wire lead to solid connection Replace starter and Pressure switch
Unit has power but won't run	Starter tripped Starter coil out Pressure switch closed Low Oil monitor tripped (Elite units) Motor or Pump locked up	Re-set starter Replace starter and Pressure switch Check unit for proper oil level Replace motor or pump
Compressor Chatters (run and stops in a short period of time)	Pressure switch connection corroded Starter is not getting enough voltage to close coil Low oil switch tripping	Replace pressure switch Check unit voltage Check the oil level in the unit

NOTE: Low Voltage-Low voltage can cause a multitude of problems. The most common cause of low voltage is when the wire size supplying the power to the compressor is too small. The longer the run of wire the larger the diameter must be to overcome the inherent voltage loss caused by the wire resistance. The supply voltage at the main panel could also be low as supplied by you local power company or you may have too many other pieces of equipment running off the same panel. You local electrician should be contacted to evaluate and correct the problem according to the Nation Electric Code. Other Symptomxs of low voltage can be flickering lights and computer screen when the compressor tries to turn on.

Compressor Maintenance

WARNING: To avoid personal injury, always shut OFF the main power supply and disconnects to the compressor, relive all air pressure from the system, and check electrical system with electrical probe before starting any service or maintenance on the compressor.

DAILY:

Drain the Receiver- condensation will accumulate in the tank daily, and should be drained at least once a day. This is done to reduce corrosions of the tank from the inside. Always wear protective eye wear when draining the tank.

Check Pump Oil Level- All units have a sight glass the oil level non running units should be no lower than ½ way on the sight glass if it is lower then you need to add oil until it is at least ½ way up the sight glass.

Check unit for any unusual noise or vibrations.

WEEKLY:

Clean air filter: this will ensure that no dirt or heavy particulate makes its way into the compressors valve assemblies.

Clean external parts of compressor and electric motor: this helps to ensure proper cooling and prevents rust and corrosion on critical parts.

Check safety Valves: this is don't to ensure they are not stuck in place and operating properly.

Elite Units Check auto tank drain for proper function

MONTHLY:

Inspect complete air system for leaks: this is done to make sure the compressor does not get out of its duty cycle due to air leak in the system.

Inspect Oil for Contamination: this is done to ensure that harmful deposits do not build up in the oil.

Check belt tension: this is done to ensure the belt do not fail pre-maturely, tighten them as needed to ensure they do not slip. If belts are loose, tighten per instructions on next page. Failure to tighten can cause pre-mature belt failure.

EVERY 3 MONTHS OR 500HRS (WHICHEVER COMES FIRST):

Change Oil: this is done to ensure that the compressor has proper oil level and that the oil in the machine does not deteriorate past factory specifications.

Inspect Valve assemblies: this is done to prevent premature failure and clean out and carbon that can form in older valves.

*ELITE UNITS:

Clean auto tank drain strainer and check for proper function.

Inspect pressure switch for proper function.

Inspect check valve for proper function and remove any carbon accumulation to prevent premature failure.

*Clean belt guard coolers (if equipped).

STORAGE OF COMPRESSOR:

Before storing the compressor for a prolonged period of time, use a blow gun to clean all debris from compressor. Shut OFF main power and turn OFF disconnect. Drain tank pressure, clean air filter, drain old oil and replace with new oil. Cover the unit to prevent dust and moisture from collecting on the unit.

NOTE: Maintaining proper oil level and performing oil changes at proper intervals is necessary for the proper function of the air compressor system. The best oil for you air compressor is **CAS30100 full synthetic reciprocating compressor oil**.

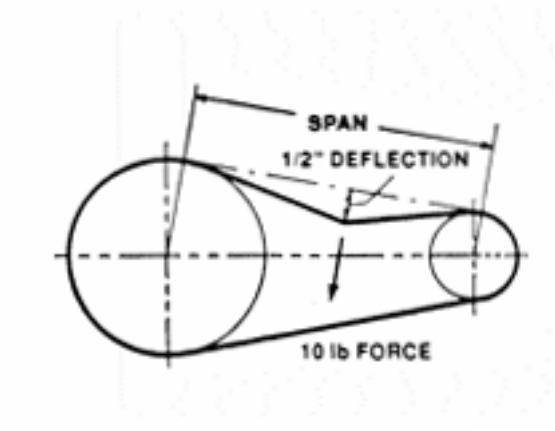
Your average vehicle travels 30,000 highway miles in 500 hrs or 15,000 city miles in 500 hrs at 210° F or less. In the same 500 hrs/3 months a reciprocating compressors operating temperature may exceed 350° F.

Adjusting Belt Tension

Proper belt tension and pulley alignment must be maintained for maximum drive efficiency and for maximum belt life. The correct tensions exists if a deflection of ½ inch occurs by placing 10lbs of force midway between the motor pulley and the compressor flywheel. This deflection can be adjusted by the following procedure. The pulley should be carefully aligned with the flywheel and set screws should be kept tight.

1. Remove the belt guard
2. Loosen the motor mounting bolts
3. Shift the motor to the point where the correct deflection exists
4. Retighten the motor mounting belts
5. Check to ensure that the tension remain correct after tightening
6. Re-install the belt guard. All moving parts must be guarded

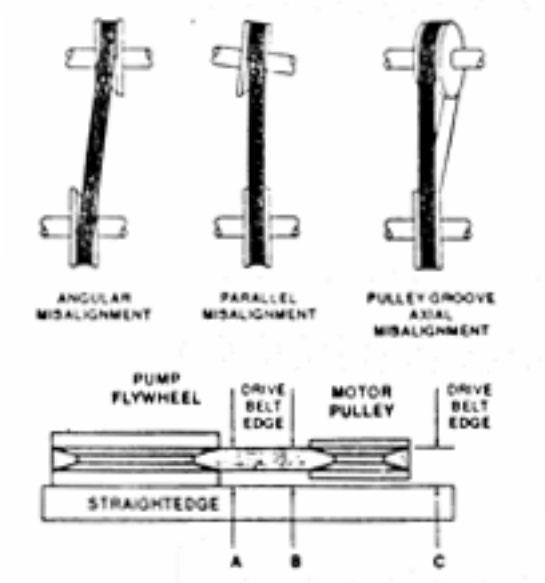
NOTE: Drive belt tension and pulley alignment are done at the same time. They are discussed separately for clarity.



Pulley Alignment

The figure to the side shows 3 examples of misaligned pulleys. To check pulley alignment, remove the belt guard and place a straightedge against the compressor flywheel, measure and record the distance from the straightedge to the edge of the drive belt. Then measure the distance to the edge of the drive belt on the motor pulley at the same edge. As long as both points measure the same distance the pulleys will be aligned if not you will need to move the pulley until its in alignment this may take a few tries. To re-align the pulley follow the steps below

1. Loosen the motor mounting bolts
2. Remove the belt guard
3. Loosen the set screw on the motor pulley
4. Align the motor pulley with the compressor flywheel
5. Re-tighten the motor pulley set screws
6. Adjust the proper belt tension
7. Re-tighten the motor mounting bolts
8. Re-install the belt guard



Description of Compressor

WHAT IS A RECIPROCATING COMPRESSOR?

A reciprocating compressor is a piston type pump which develops pressure from the action of a piston moving through a cylinder. The cylinder, or cylinders, may be vertical, horizontal or angular.

When air is drawn in from the atmosphere and compressed to its final pressure in a single stroke, the compressor is referred to as a "single stage" pump. Single stage units normally are used in the 90 to 125psi range and are available as single or multi-cylinder (twin cylinder) compressors.

When the air drawn from the atmosphere is compressed first to an intermediate pressure, and then further compressed to a higher pressure, it is done in a "two stage" pump. These cylinders are unequal in size and the first stage always takes place in the larger, low pressure cylinder. From there it passes through the inner cooler to the smaller, high pressure cylinder. The cycle is completed as the air then moves through the after cooler and discharge line into the tank. Two stage compressors are generally used for pressure ranges from 100 to 175 PSI and deliver more air per horsepower at these pressures. This increase in efficiency is partially due to the heat dissipated as the air passes through the inner cooler.

Description Of Cooling

Our compressors are cooled by fan blades, incorporated into the driven sheave (pulley), blowing air across the intercooler, after cooler, and cylinder head.

Description Of Controls

Stop/Start Receiver or plant air system pressure is controlled within limits by a pressure switch automatically stopping and starting the compressor as the air pressure reaches a maximum preset pressure (cut out) and then drops to a minimum presser pressure (cut in).

WARNING: Always wear proper protective eye ware, hearing protection and safety clothing when working around the compressor package. No loose or baggy clothing should be worn around compressor package at any time.

WARNING: On Electric motor powered air compressors make sure electrical system is up to National Electric Code (NEC) prior to installing compressor system. Failure to install a compressor with a proper NEC electrical system can cause personal injury, compressor package damage and void compressor package warranty

NOTICE: To ensure full compressor tank warranty all tank mounted compressor packages must be mounted on factory approved vibration isolation pads. A compressor should NEVER be installed while still on or in its original packaging. Failure to properly install the compressor system with approved vibration isolation pads will result in the compressor tank warranty being void.

WARNING: Compressed Air Systems compressors can operate at pressures from 0-250psi depending on the compressor package design and build specifications. Always verify that the system the compressor is installed into can handle the maximum operational pressure the compressor. NEVER install a compressor in a system that can not handle the compressors maximum operating pressure.

WARNING: Compressed air is extremely dangerous when not properly used or installed. Always make sure a trained compressed air professional has looked over the air system prior to use. Improper installation or use of compressed air can cause bodily injury or death. NEVER pressurize an object that was not designed to be pressurized. Pressurizing objects not properly engineered for the maximum operating pressure of the compressor system can cause bodily injury or death.

Receiving and Uncrating of your Compressor

BEFORE UNCRATING THE COMPRESSOR THE FOLLOWING STEPS SHOULD BE TAKEN.

1. Immediately upon receipt of the equipment, it should be inspected for damage that may have occurred during shipment. If any damage is found, demand an inspection immediately by an inspector from the carrier. Ask him/her how to file a claim for damages. (Never attempt to move compressor without proper lifting equipment).
2. Insure that adequate lifting equipment is available for moving the machinery.
3. Read the compressor nameplate to be sure the compressor is the model and size ordered.
4. Read the motor nameplate to be sure the motor is compatible with your electrical conditions. (Volts-Phase-Hertz).

IMPORTANT: If voltage supplied to the compressor is below 208 volts the unit need a 200 Volt drive motor and 208-230-460 Volt should not be used below 208 volts.

NOTE: Standard motors are open drip proof with a maximum ambient temperature rating of 104 degrees F. They are not suitable for salt laden, corrosive, dirty, wet, or explosive environments.

Improper lifting can result in component or system damage or personal injury.

Follow good shop practices and safety procedures

Under no circumstances should a compressor be placed in an area that may be exposed to a flammable, toxic, volatile or corrosive atmosphere nor should flammable, toxic, volatile or corrosive agents be stored near the compressor.

Compressor Installation

LOCATION

Locate the compressor in an indoor area that is clean, dry, well lighted, and well ventilated, with sufficient space for safe and proper inspection and maintenance. Ambient temperatures should not exceed 104 degrees F or fall below 30 degrees unless an electric motor rated for a higher temperature is used. Inspection and maintenance checks are required daily, therefore, ample space is required around the compressor.

The compressor must not be installed closer than 18 inches from a wall or from another compressor to allow ample circulation or air across the compressor cylinders and head, and through the coolers if they are part of the system. Additional safety can be achieved by locating the pulley guard next to the wall.

MOUNTING

The use of the factory supplied rubber vibration isolation pads, or other factory supplied vibration isolation mounting equipment is required for tank warranty from the original tank manufacturer. The compressor should never be left on original shipping material for installation. If a shim is required to level the unit, place it between the pad and floor. If you bolt the unit to the floor, use the bolts as guide pins and do not tighten the bolts. The rubber pads are used to absorb machine vibration and cannot work effectively if bolted tightly.

INDUCTION SYSTEM

Do not locate the compressor where it could ingest or ignite toxic, explosive or corrosive vapors, ambient air temperatures exceeding 110 degrees F, water or extremely dirty air. Ingestion of any of the above noted atmospheres by the compressor could jeopardize the performance of the equipment and all personnel exposed to the total compressed air system.

Destructive pulsations can be induced by reciprocating compressors that will damage walls and break windows. Pulsation can be minimized by adding a pulsation dampener on the inlet side of the compressor.

For compressor tank to have full manufacturer warranty. The tank must be installed properly on manufacturer supplied vibration pads per compressor manual. Failure to do so can void compressor tank warranty and cause tank cracks or failures.

On Electric compressors all electrical connections must be wired and installed per NEC (National Electric Code) (See the back of the manual for NEC code) and all local applicable codes for full electric component warranty. Failure to do so can void compressor electrical warranty.

NOISE

Noise is a potential health hazard that must be considered. There are local and federal laws specifying maximum acceptable noise levels that must not be exceeded. Most of the noise from a reciprocating compressor originates from the air inlet point. Excessive noise can be greatly reduced by installing an intake noise silencer. Intake noise silencers are available from the compressor manufacturer.

PIPING FITUP

Care must be taken to avoid assembling the piping in a strain with the compressor. It should line up without having to spring or twist into position. Adequate expansion loops or bends should be installed to prevent undue stresses at the compressor resulting from the changes between hot and cold conditions. Pipe support should be mounted independently of the compressor and anchored as necessary to limit vibration and prevent expansion strains.

Safety valves are to protect system integrity in accordance with ASME Codes and ANSI B19.3 safety standards. Failure to use safety valves of the proper capacity and pressure will cause severe personal injury or death.

NOTE: **Standard motors are open drip proof with a maximum ambient temperature rating of 104 degrees F. They are not suitable for salt laden, corrosive, dirty, wet, or explosive environments.**

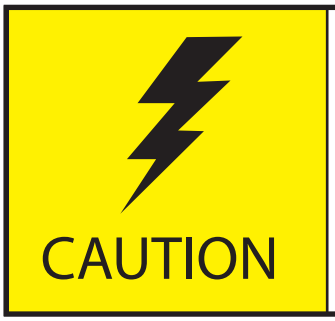
SAFETY VALVES: **Safety valves are pressure relief valves and should be sized and purchased with a pressure setting to protect the weakest link in the system. Never change the pressure setting, only the safety valve manufacturer is qualified to make a change. Safety valves are to be place ahead of any potential blockage point which included but is not limited to, shutoff valves, heat exchangers, pulsation dampeners, and discharge silencers.**

Failure to properly size, set and install pressure relief valves can be fatal.

ASME coded pressure vessels must not be modified, welded, repaired, re-worded or subjected to operation conditions outside the nameplate ratings. Such actions will negate code status, affect insurance status and may cause severe personal injury, death, and property damage.

PRESSURE VESSELS

Air receiver tanks and other pressure containing vessels such as, but not limited to, pulsation bottles, heat exchangers, moisture separators and traps, shall be in accordance with ASME Boiler and Pressure Vessel Code Section VIII and ANSI B19.3 Safety Standards.



The installation, wiring, and all electrical controls must be in accordance with ANSI C1 National Electric Code, ANSE C2 National Electric Safety Code, state and local codes. All electrical work should be performed by a qualified electrician. Failure to abide by the national, state and local codes may result in physical and/or property damage.

ELECTRICAL

Before installation, the electrical supply should be checked for adequate wire size, breaker size, transformer and capacity. During installation a suitable fused or circuit breaker disconnect switch should be provided. Where a 3 phase motor is used to drive a compressor, any unreasonable voltage unbalance between the legs must be eliminated and any low voltage corrected to prevent excessive current draw. Compressors must be equipped with a properly wired magnetic motor starter or a pressure switch rated to carry the full motor current load. The coil which engages and disengages the contact points in the motor starter is controlled by the pressure switch. Never attempt to bypass the pressure switch or adjust it past the factory set pressure range. Improper installation of the electrical system can cause the motor to overheat or a short circuit to occur.

Electric power always exists inside the pressure switch when there is electric power at the compressor package. Either a qualified electrician should make the pressure adjustments or the electric power supply should be disconnected and locked out before making any adjustment.

NEVER exceed the designed pressure for the system or overload the motor beyond its service factor.

FAILURE TO HEED THESE WARNINGS MAY RESULT IN SERIOUS INJURY OR DEATH, PROPERTY DAMAGE AND/OR MECHANICAL FAILURE

PRESSURE SWITCH

The pressure switch is automatic in operation and is adjusted to start and stop the unit at the minimum and maximum desired air receiver pressure by cutting in and out the power to the electric motor. On some models, the pressure switch incorporates a release valve, which releases air between the check valve located in the receiver and discharge valve in the head of the compressor.

Relieve compressor and system air pressure by opening the appropriate manual relief valve prior to servicing.

Failure to relieve all system pressure may result in severe personal injury, death and property damage.

MANUAL RELIEF AND SHUTOFF VALVES

Install a manual relief valve to vent the compressor to atmosphere. In those instances where the air receiver tank services a single compressor, the manual relief valve can be installed on the receiver. When a manual shut- off valve, and a safety relief valve installed upstream from the manual relief valve. These valves are to be designed and installed as to permit maintenance to be performed in a safe manner. Never substitute a check valve for a manual shut-off valve (block valve) if the purpose is to isolate the compressor from a system for servicing.

Guards must be fastened in place before starting the compressor and never removed before cutting off and locking out the main power supply.

GUARDS

All mechanical action or motion is hazardous in varying degrees and needs to be guarded.
Guarding shall be in compliance with OSHA Safety and Health Standards 29 CFR 1910.219 in OSHA manual 2206 and any state or local code.

Excessive speed of the compressor or driver can be lethal. Never operate the compressor beyond the manufacturer's recommendation.

Bursting of the flywheel may be the greatest threat because the normal guard may not contain all the pieces.

Crankshaft and connecting rod breakage is a possibility and compressor efficiency, valve life and bearing life will be abnormally reduced.

DRIVES

It is important that the compressor and motor pulleys are aligned properly and the V belt is correctly tensioned. Improper pulley alignment and belt tension are causes for motor overloading, excessive vibration, and premature belt and/or bearing failure.

Removal or painting over safety labels will result in uninformed conditions. This may result in personal injury or property damage. Warnings signs and labels shall be provided with enough light to read, conspicuously located and maintained for legibility. Do not remove any warning, caution, or instructional material attached!

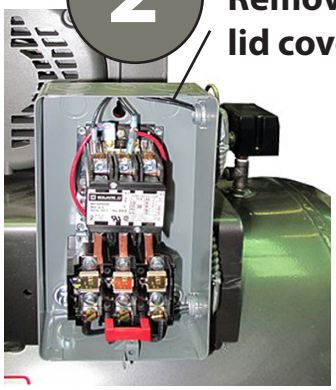
Provisions should be made to have the instruction manual readily available to the operator and maintenance personnel. If for any reason any part of the manual becomes illegible or if the manual is lost, have it replaced immediately. The instruction manual should be periodically read to refresh one's memory, it may prevent a serious or fatal accident.

3 Phase Piston Compressor Wiring Diagram

ALWAYS MAKE SURE POWER IS OFF BEFORE WIRING COMPRESSOR

1 Punch out hole in duplex control panel for power inlet.

2 Remove Starter lid cover

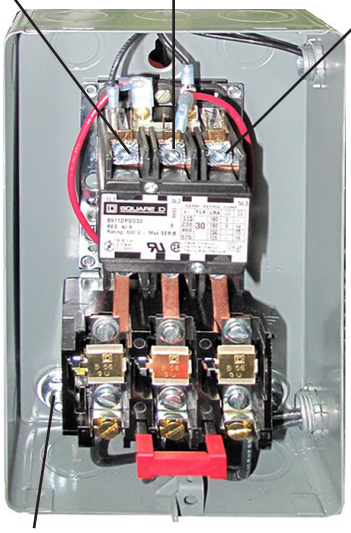


3

Place power line 1 under set screw

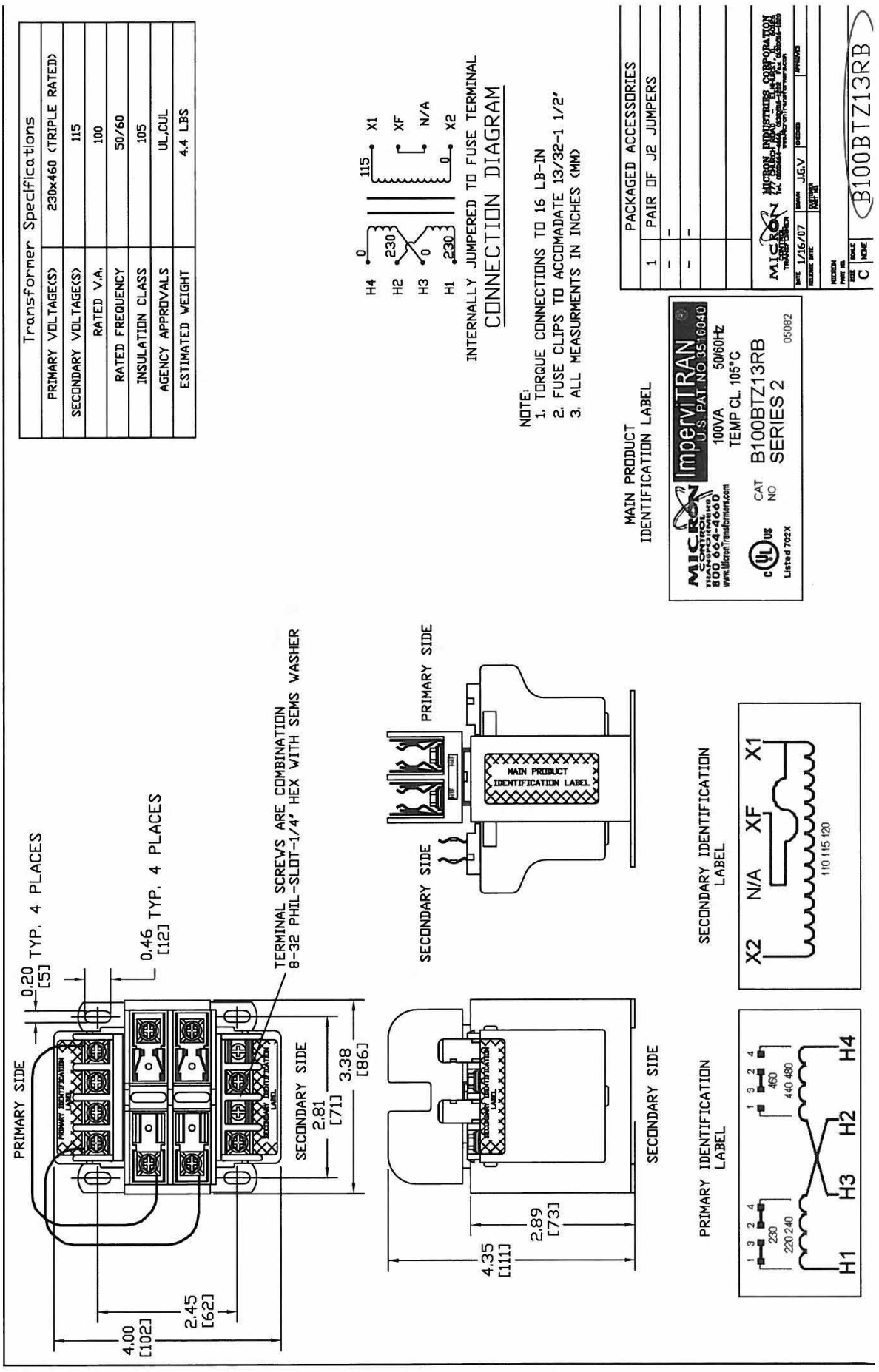
Place power line 2 under set screw

Place power line 3 under set screw

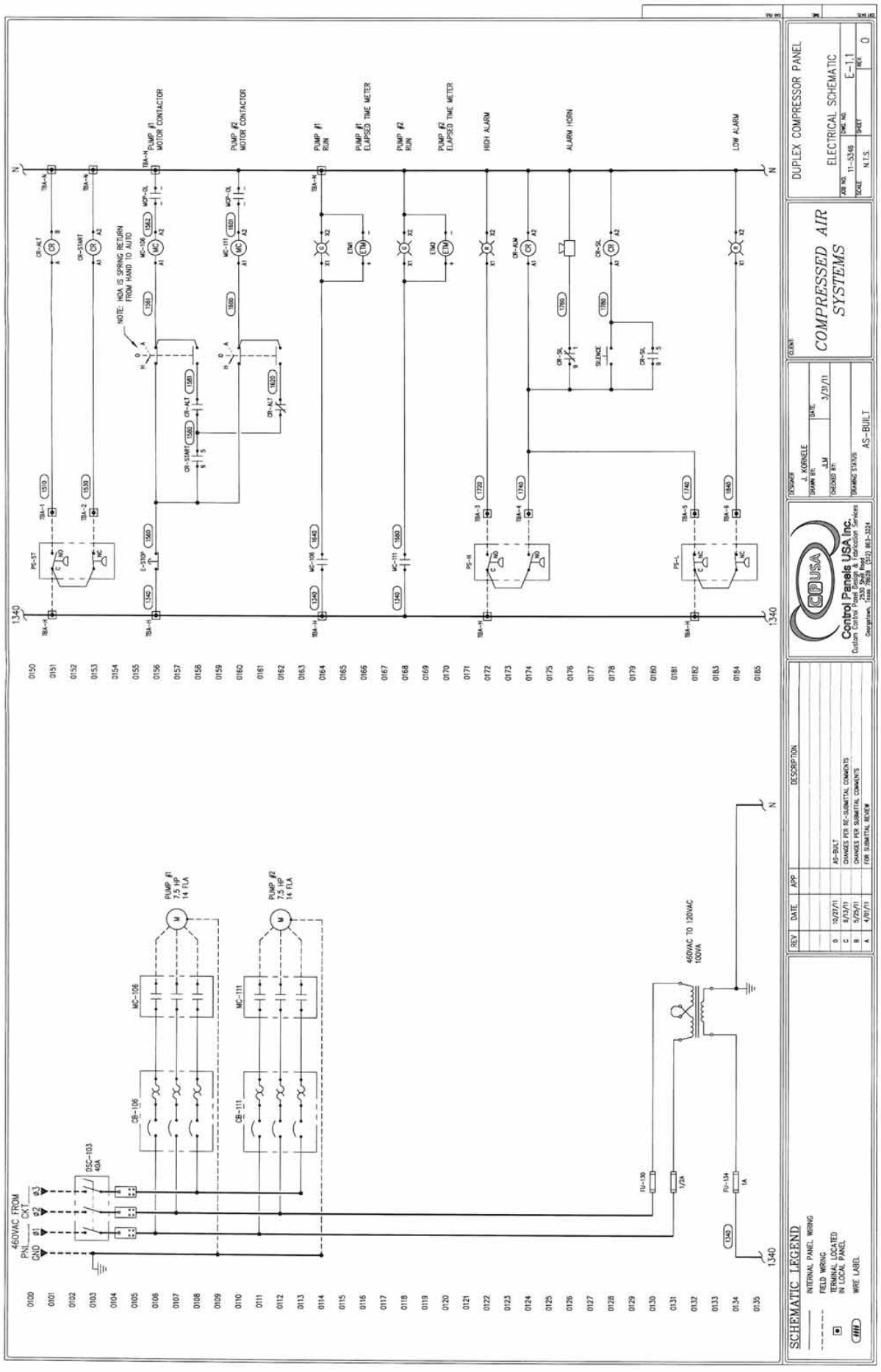


Place ground wire under washer

4 Check all fitting to make sure that they are tight and place cover back on starter box before checking for correct rotation. If rotation is incorrect swap line 1 and line 3 to reverse rotation


Transformer Specifications
PRIMARY VOLTAGE(S) 230x460 (TRIPLE RATED)
SECONDARY VOLTAGE(S) 115
RATED V.A. 100
RATED FREQUENCY 50/60
INSULATION CLASS 105
AGENCY APPROVALS UL,CUL
ESTIMATED WEIGHT 4.4 LBS
CONNECTION DIAGRAM
INTERNALLY JUMPERED TO FUSE TERMINAL
H4 0
H2 230
H3 0
H1 230
115 X1
XF
N/A
0 X2
NOTE:
1. TORQUE CONNECTIONS TO 16 LB-IN
2. FUSE CLIPS TO ACCOMADATE 13/32-1 1/2"
3. ALL MEASURMENTS IN INCHES (MM)
PACKAGED ACCESSORIES
1 PAIR OF J2 JUMPERS
MAIN PRODUCT IDENTIFICATION LABEL
MICRON CONTROL
ImperviTRAN
US PAT NO 5516040
100VA 50/60Hz
TEMP CL. 105°C
CAT NO B100BTZ13RB
SERIES 2
05082
Listed 702X
PRIMARY SIDE
0.20 [5] TYP. 4 PLACES
0.46 [12] TYP. 4 PLACES
TERMINAL SCREWS ARE COMBINATION 8-32 PHIL-SLOT-1/4" HEX WITH SEMS WASHER
SECONDARY SIDE
2.81 [71]
3.38 [86]
4.00 [102]
2.45 [62]
SECONDARY SIDE
PRIMARY SIDE
MAIN PRODUCT IDENTIFICATION LABEL
4.35 [111]
2.89 [73]
SECONDARY SIDE
SECONDARY IDENTIFICATION LABEL
X2 N/A XF X1
110 115 120
PRIMARY IDENTIFICATION LABEL
1 3 2 4
230 220 240
1 3 2 4
460 440 480
H1 H3 H2 H4
MICRON INDUSTRIES CORPORATION
DRAWN J.G.V
DATE 1/16/07
B100BTZ13RB
C

7.5 HP Duplex Electric Reciprocating Compressor



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TO REMOTE MONITORING
SCHEMATIC LEGEND
INTERNAL PANEL WIRING
FIELD WIRING
TERMINAL LOCATED IN LOCAL PANEL
WIRE LABEL
REV
DATE
APP
DESCRIPTION
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10/27/11
AS-BUILT
C
6/13/11
CHANGES PER RE-SUBMITTAL COMMENTS
B
5/25/11
CHANGES PER SUBMITTAL COMMENTS
A
4/01/11
FOR SUBMITTAL REVIEW
CPUSA
Control Panels USA Inc.
Custom Control Panel Design & Fabrication Services
7330 Boat Rock
Houston, Texas 77078 (832) 863-3224
DESIGNER
J. KORNELE
DRAWN BY:
DATE:
JLM
3/31/11
CHECKED BY:
DRAWING STATUS
AS-BUILT
CLIENT
COMPRESSED AIR SYSTEMS
DUPLEX COMPRESSOR PANEL
ELECTRICAL SCHEMATIC
JOB NO.
11-3346
DWG. NO.
E-1.2
SCALE
N.T.S.
SHEET
REV.
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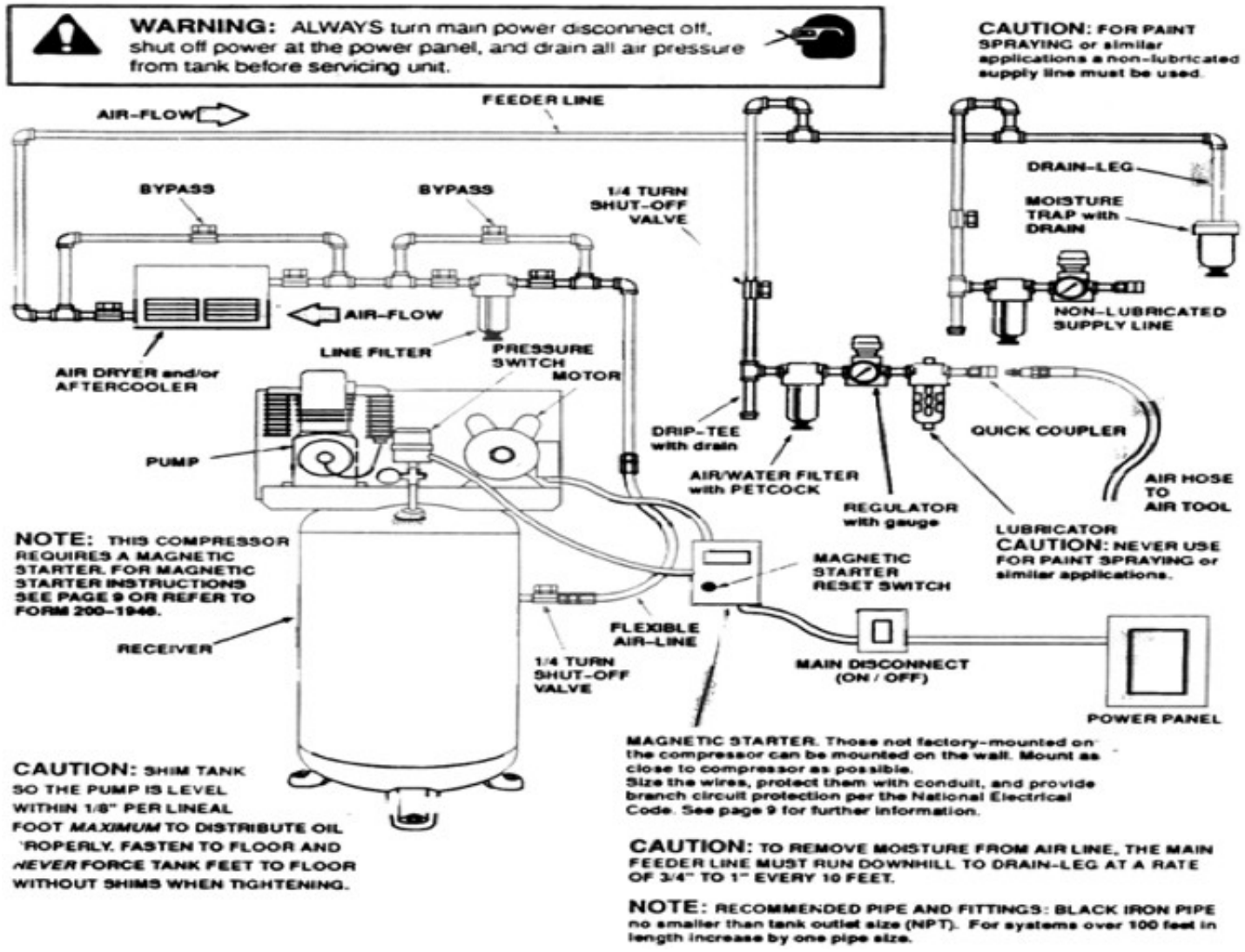
Installation Diagram

NOTE: This diagram is only a guide to a typical system. Consult your distributor for detailed information regarding your particular installation.



Actual Installation/

Start Up Preparation & Procedures

The following check list shall be adhered to before putting the compressor into operation.

FAILURE TO PERFORM THE CHECKS MAY RESULT IN SERIOUS INJURY OR DEATH, PROPERTY DAMAGE AND/OR MECHANICAL FAILURE. DISCONNECT AND LOCK OUT POWER SUPPLY.

1. Remove all loose pieces and tools around the compressor installation.
2. Check oil level in crankcase, add as necessary.
3. Check all pressure connections for tightness and leaks.
4. Check to make sure all safety relief valves are in place and operational.
5. Check to be sure all guards are in place and securely mounted.
6. Check fuses, circuit breakers and thermal overloads for proper size.
7. Open all manual shut-off valves (block valves) at and beyond the compressor discharge.
8. On all 3 phase units, after all of the above conditions have been satisfied, jog the starter switch button to check the rotational direction of the compressor. It should agree with the rotation arrow on the flywheel/pulley (counter clockwise, facing the shaft).

The following procedures should be followed for start-up of a new installation, or after changes have been made to an existing installation, and/or after service repair work has been performed.

1. Instructions in addition to those contained within this manual, supplied by manufacturers of supporting equipment, must also be read and understood before start-up.
2. Check oil level in crankcase.
3. Drain moisture from air receiver and traps.
4. Start compressor and watch for excessive vibration or strange noises. If either is observed, stop the compressor immediately and correct.
5. Check air receiver or system pressure.
6. Manually activated safety relief valves by pulling ring or lever.
7. Check operation of controls, including duplex controls
8. After two days of operation check belt tension, air piping for leaks, and crankcase oil level.

Stopping for Maintenance or Service

Never assume the compressor is ready for maintenance or service because it is stopped.

The automatic stop-start control may start the compressor at any time!

THE FOLLOWING PROCEDURE SHOULD BE FOLLOWED TO MAXIMIZE SAFETY WHEN PREPARING FOR MAINTENANCE OR SERVICE.

1. Disconnect and lock-out the main power switch and hang a sign at the switch Informing of the unit being serviced.
2. Close shut-off valve (block valve) between receiver and compressor, or receiver and Plant air system, to prevent any back-up of air flow into the area to be serviced.
3. Lock open manual vent valve and wait for the pressure in the area to be serviced (compressor, receiver, etc.) to be completely relieved before starting service. The Manual vent valve may be the drain valve in the receiver. NEVER remove a plug to relieve the pressure.
4. Open all manual drain valves within the area to be serviced.
5. Wait for the unit to cool before starting service, (temperatures at 125 degrees F can burn the skin), some surface temperatures exceed 400 degrees F when the compressor is working).
6. Clean up all oils spills immediately to prevent slipping. (Mark spill area accordingly.)

Common Maintenance Parts

CA1(U) PUMP	Part Number
Reciprocating Pump Oil	IAT-30100
Air Filter Element	IAT-CA-712114
Air Filter Housing	IAT-CA-712140

CA2(U) PUMP	Part Number
Reciprocating Pump Oil	IAT-30100
Air Filter Element	IAT-CA-712114
Air Filter Housing	IAT-CA-712140

G43 PUMP	Part Number
Reciprocating Pump Oil	IAT-30100
Air Filter Element	IAT-CA-712114
Air Filter Housing	IAT-CA-712140

PUMP OIL CAPACITIES	Ounces
CA1(U)	50
CA2(U)	60
G43	132
462	240
LDV95T	30
LDV80	30
LDV65	22
LDV51	22

Part numbers subject to change/update always consult factory prior to ordering

Maintenance Procedures Review

DAILY:

Drain the Receiver- condensation will accumulate in the tank daily, and should be drained at least once a day. This is done to reduce corrosions of the tank from the inside. Always wear protective eye wear when draining the tank.

Check Pump Oil Level- All units have a sight glass the oil level non running units should be no lower than ½ way on the sight glass if it is lower then you need to add oil until it is at least ½ way up the sight glass.

Check unit for any unusual noise or vibrations.

WEEKLY:

Clean air filter: this will ensure that no dirt or heavy particulate makes its way into the compressors valve assemblies.

Clean external parts of compressor and electric motor: this helps to ensure proper cooling and prevents rust and corrosion on critical parts.

Check safety Valves: this is don't to ensure they are not stuck in place and operating properly.

Elite Units Check auto tank drain for proper function

MONTHLY:

Inspect complete air system for leaks: this is done to make sure the compressor does not get out of its duty cycle due to air leak in the system.

Inspect Oil for Contamination: this is done to ensure that harmful deposits do not build up in the oil.

Check belt tension: this is done to ensure the belt do not fail pre-maturely, tighten them as needed to ensure they do not slip. If belts are loose, tighten per instructions on next page. Failure to tighten can cause pre-mature belt failure.

EVERY 3 MONTHS OR 500HRS (WHICHEVER COMES FIRST):

Change Oil: this is done to ensure that the compressor has proper oil level and that the oil in the machine does not deteriorate past factory specifications.

Inspect Valve assemblies: this is done to prevent premature failure and clean out and carbon that can form in older valves.

*ELITE UNITS:

Clean auto tank drain strainer and check for proper function.

Inspect pressure switch for proper function.

Inspect check valve for proper function and remove any carbon accumulation to prevent premature failure.

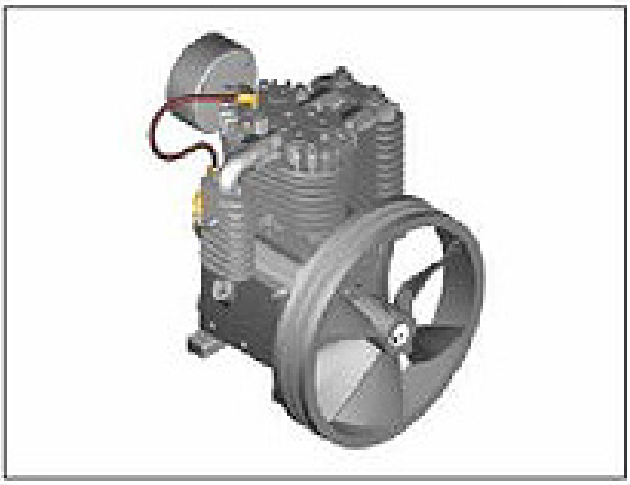
*Clean belt guard coolers (if equipped).

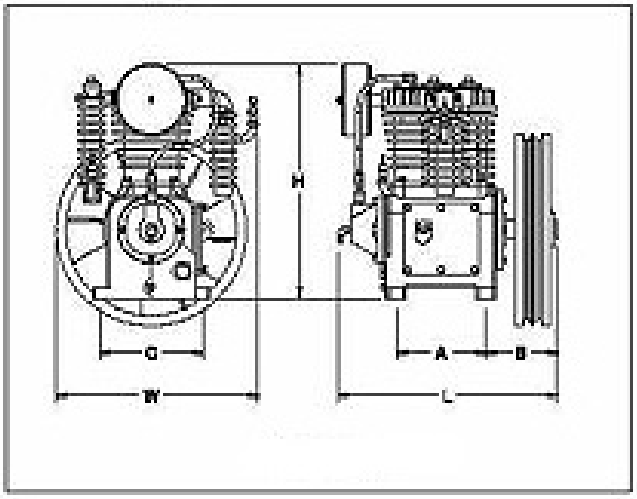
STORAGE OF COMPRESSOR:

Before storing the compressor for a prolonged period of time, use a blow gun to clean all debris from compressor. Shut OFF main power and turn OFF disconnect. Drain tank pressure, clean air filter, drain old oil and replace with new oil. Cover the unit to prevent dust and moisture from collecting on the unit.

NOTE: Maintaining proper oil level and performing oil changes at proper intervals is necessary for the proper function of the air compressor system. The best oil for you air compressor is **CAS30100 full synthetic reciprocating compressor oil**.

Your average vehicle travels 30,000 highway miles in 500 hrs or 15,000 city miles in 500 hrs at 210˚ F or less. In the same 500 hrs/3 months a reciprocating compressors operating temperature may exceed 350˚ F.





**Cast Iron Construction *Precision Cast Steel Crankshaft and Connecting Rods *Needle Bearings Top and bottom of Connecting Rod *Swedish Stainless Steel Valves*European Design *American Engineered *Ball Bearings on Ends of Crankshaft *Units Run Efficiently Over Wide range of rpm's, 600 to 1500 *High *Quality Components *Quality Assured Manufacturing *Quality Service *Competitive Prices*

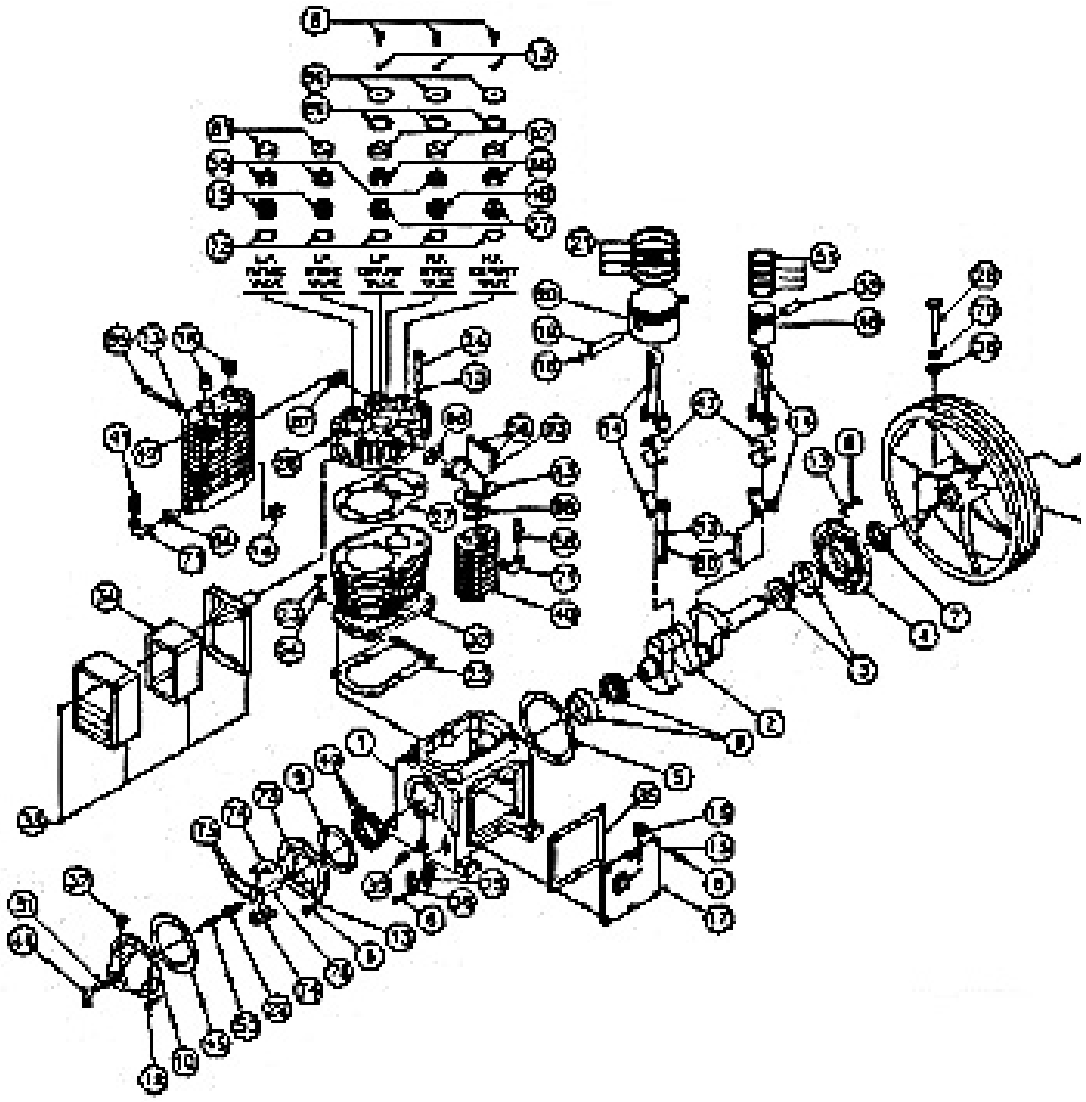
Performance		
Motor	HP KW	7.5 5.48
Pressure	psi bar	145 1.0
Cylinders		2
Piston LP	inch mm	4.13 105
Piston HP	inch mm	2.16 55
Stroke	inch mm	3.5 89
RPM		1100
Displacement	DCFM m3/min	29.9 .85
Air Delivered	ACFM m3/m	21.7 .62
Efficiency %		72.5
Flywheel Dia.	inch mm	17 430
Groove Type		1/B

Dimensions		
A	inch mm	7.75 197
B	inch mm	5.63 1.44
C	inch mm	9.0 229
L	inch mm	18 457
W	inch mm	17 432
H	inch mm	20 508
Weight	kg lb	102 225
QTY 20" container QTY 40" container		144 216

LEGEND

1HP=.7457KW 1 inch=25.4mm 1 Bar=14.5psi 1KG=2.205lbs
Cu. Meter=35.3CFM

7.5 HP Electric Two Stage Cast iron Model CA1



7.5 HP Duplex Electric Reciprocating Compressor

Item	CAS #	Part	Description	Qty
1	049-0027	708000	Crankcase	1
2	053-0051	709000	Crankshaft	1
3	051-0053	050170	Bearing Set Front	1
4	045-0044	701000	Front Bearing Carrier	1
5	046-0168	070163	Gasket Front Cap	1
6	059-0166	110117	Capscrew Hex M8X20	21
7	046-0179	060068	Seal -Shaft	1
8	051-0054	050172	Bearing Set Rear	1
9	046-0227	070172	Gasket Rear Cap	1
10	077-0071	728004	Centrifugal Adapter Plate	1
11	044-0037	713002	Flywheel 16 7/8"	1
12	059-0156	110104	Capscrew Skt HD M6X20	4
13	060-0061	070201	Gasket Copper	14
14	047-0054	705000	Rod Connecting Aluminum w/bushing	2
15	043-0098	727000	Valve Assembly-LP Inlet	2
16	062-0006	160004	Plug Oil Fill-3/4" NPT	4
17	077-0069	020146	Cover Crankcase Side	1
18	054-0119	200100	Snapring Internal	2
19	052-0027	729000	Wristpin- LP Piston	1
20	048-0054	720000	Piston LP 105mm	1
21	054-0179	719064	Piston Ring Set LP	1
22	046-0167	070162	Gasket Cylinder To Crankcase	1
23	059-0159	110107	Capscrew Hex 10 X 25	6
24	059-0167	110111	Capscrew Hex 12 X 70	8
25	046-0178	070171	Gasket Sight Glass	1
26	059-0163	110108	Capscrew Hex 16 X 80	1
27	046-0166	070161	Gasket Cylinder Head	1
28	042-0055	710000	Head Cylinder	1
29	055-0051	723003	Spring Unloader	1
30	062-0004	160005	Plug Oil Drain-3/8" NPT	1
31	058-0084	120058	Nut Adjustment Lock	1
32	050-0030	711000	Cylinder	1
33	019-0097	712000	Filter Inlet Assembly	1
34	019-0023	712114	Filter Element	1
35	046-0169	070164	Gasket Side Cover	1
36	032-0031	731004	Flanged Sight Glass	1
37	056-0018	703007	Breather	1
38	058-0086	120060	Nut Hex-M16	1
39	146-0015	080029	Key Flywheel	1
40	082-0014	706004	Aftercooler	1
41	136-0046	722005	Valve Safety 75 PSI	1
42	082-0012	706000	Intercooler	1
43	083-0009	706002	Elbow Aftercooler	1
44	031-0057	704000	Elbow Valve and Unloader	1
45	046-0171	070166	Gasket Unloader Cover	1
46	048-0081	720002	Piston-HP	1
47	051-0055	050122	Insert Rod-Bearing Half	4
48	043-0100	727001	Valve Assembly-HP Inlet	2
49	046-0177	090095	Shim .015 Brg Adjustment	A/R
49	046-0176	090094	Shim .010 Brg Adjustment	And/Or
49	046-0175	090093	Shim .005 Brg Adjustment	And/Or
50	078-0011	728003	Plunge Unloader	1
51	054-0178	719088	Set HP Piston Rings	1
52	052-0028	729006	Wristpin HP Piston	1
53	060-0072	130060	Lockwasher 10	4
54	060-0063	070203	Gasket Copper	6
55	043-0094	727003	Spacer Inlet Valve	3
56	136-0007	722007	Valve Safety 200 PSI ASME	1
57	043-0100	727002	Valve Assy HP/LP Discharge	2
58	059-0158	110106	Capscrew SKT Head 8 X 25	4
59	077-0073	727136	Cover Valve	3
60	059-0154	110102	Capscrew SKT Head M10x45	4
61	058-0082	727134	Retainer Inlet Valve	2
62	058-0083	727135	Retainer Discharge Valve	3
63	060-0070	130058	Lockwasher 8	4
64	063-0006	160002	Bushing Reducing 3/4"M X 1/4"F NPT	1
65	059-0157	110105	Capscrew Hex M8X85	4
66	046-0172	070167	Gasket Aftercooler	2
67	046-0173	070169	Gasket Intercooler	2
68	043-0095	727004	Spacer Discharge Valve	2
69	046-0174	070170	Gasket Valve Cover	3
70	060-0069	130057	Lockwasher 16	1
71	064-0022	160003	Elbow Street 90 Degrees 1/4"	2
72	060-0062	070202	Copper Valve Seat Gasket	5
73	077-0070	701029	Cap Rear	1
74	096-0009	728000	Weight Unloader	2
75	107-0015	100100	Pin - Hinge	2
76	114-0012	728002	Holder Unloader	1
77	046-0183	070245	Gasket Set	1

Compressed Air Systems		October 2011
Duplex Compressor Panel	Control Panels USA Inc.	CP USA Job # 11-5346

SCHEDULE OF EQUIPMENT - Final As Built

ITEM #	DESCRIPTION	MANUFACTURER	PART NUMBER	QUANTITY	UNIT
	Duplex Panel				
1	Enclosure, Type Nema 4, Wall mount, with quarter turn latches	Saginaw	SCE-42EL3016LP	1	each
2	Back Panel	Saginaw	SCE-42P30	1	each
3	Alarm Horn, 120VAC, Nema 4X, with Trim Ring for panel mount	Federal Signal	350-120VAC-TR	1	each
4	Main Disconnect Switch, 40AMP, with 11"Shaft	C3Controls	PDS2-340-PHMRY-11	1	each
5	Distribution Block, 85 Amp	Erico	569010	3	each
6	Motor Contactor, 22AMP, 120VAC Coil	Cerus	CRC-22A-120VAC	2	each
7	Manual Motor Starter with Instantaneous Trip & Adjustable Thermal Trip, FLA 9-13	Cerus	CMS-32S-13	2	each
8	Any Trip Alarm Switch, 2-pole	Cerus	LA-1NO-1NC	2	each
9	Control Transformer, 100VA, 230x460 Primary, 115 Secondary	Micron	B100BTZ13RB	1	each
10	Fuse, Class CC	Bussmann	FNQ-R-1/2	2	each
11	Fuse, Class CC	Bussmann	FNQ-R-1	1	each
12	Hour Meter, 120VAC, Panel mount, 5 digits, non-resettable, Nema 4X	ENM Company / Allied Electronics	T50A2 / 207-0039	2	each
13	Pilot Light, 22.5mm, Unibody, Nema 4X, LED, 100,000hr, 120VAC, Red	C3 Controls	W22U-120-LR-WLR	2	each
14	Pilot Light, 22.5mm, Unibody, Nema 4X, LED, 100,000hr, 120VAC, Green	C3 Controls	W22U-120-LG-WLG	2	each
15	Pushbutton, Nema 4X, Black, Flush	C3 Controls	W22PB-FK-10	1	each
16	3 Position Selector Switch with spring return from Left to Center, 22mm, IEC, Nema 4X, 1 NO & 1 NC Delayed Break Nema rated 10 amp contacts	C3 Controls	W22SLC-HW-10/D	2	each
17	E-Stop, Push-Pull, Non-illuminated, 22.5mm, Nema 4X, 1 NO, 1NC	C3 Controls	W22PP-JR-10/01	1	each
18	Relay, DPDT, 10A, 120VAC	Finder	55.32.8.120.0030	3	each
19	Relay Base, 4-pole	Finder	94.04	3	each
20	Alternating (Impulse) Relay, 12 Amp Contacts, 120VAC coil, DPDT	Magnacraft	711XBXCL-120A	1	each
21	Relay Base, 11 pin spade style	Magnacraft	70-463-1	1	each
	Typical Equipment on Each Panel				
22	Terminal Block, Feed Through, Finger Safe 26-10awg, 41 Amp, 800Volt, Type UT4	Phoenix Contact	3044102	A/R	each
23	Ground Terminal Block, Finger Safe, 26-10awg, 41 Amp, 800Volt, Type UT4-PE	Phoenix Contact	3044128	A/R	each
24	Ground Bus Bar	Square D	PK Series	A/R	each
25	Wire Way	Thomas & Betts	Ty Series	A/R	ft

Item #

SCE SAGINAW CONTROL & ENGINEERING

Your Enclosure Source®

Part Information - SCE-42EL3016LP

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Part Details - SCE-42EL3016LP

Printable Version

Part Number: SCE-42EL3016LP
Description: EL Enclosure
Height: 42.00 inches
Width: 30.00 inches
Depth: 16.00 inches
Page Number: 69
List Price: $528.98
Panel: SCE-42P30
Product Code: E3
Est. Shipweight: 117.00 lbs.
NEMA Rating: 12, 4

Construction -

- 0.075 In. carbon steel.
- Seams continuously welded and ground smooth.
- Flange trough collar around all sides of door opening.
- Oil-resistant gasket.
- Collar studs provided for mounting optional panels.
- Concealed hinge.
- Removable and interchangeable doors.
- Black quarter turn latches.
- Latches are opened or closed with a screwdriver.
- Mounting holes in back of enclosure.
- Mounting hardware, sealing washer and hole plug included.
- Removable print pocket.
- Ground studs on door and body.

Similar Part Numbers -

- SCE-30EL2008LP
- SCE-30EL2010LP
- SCE-30EL2408LP
- SCE-30EL2410LP
- SCE-30EL2412LP
- SCE-30EL2416LP
- SCE-30EL2420LP
- SCE-30EL2424LP
- SCE-30EL3008LP
- SCE-30EL3010LP
- SCE-30EL3012LP
- SCE-30EL3608LP
- SCE-36EL2408LP
- SCE-36EL2410LP

CAD Package (STP, PDF, DWG)

Having trouble with CAD Files? Click Here for help.

Application -
Designed to house electrical and electronic controls, instruments and components. Provides protection from dust, oil and water. For outdoor application a drip shield is recommended.

Finish -
ANSI-61 gray powder coating inside and out. Optional Subpanels are powder coated white.

Options -
- Optional tamper-resistant inserts are available.
- Optional mounting feet available.
- Door hardware available.

Industry Standards -
IS2
NEMA Type 4, 12, & 13
UL Listed Type 4 & 12
CSA Type 4 & 12
IEC 60529 IP 66

Notes -
Interchangeable latches and handles available in the accessory section.

SAGINAW CONTROL & ENGINEERING

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Part Details - SCE-42P30

Printable Version

Part Number: SCE-42P30
Description: Subpanel, Bent
Height: 39.00 inches
Width: 27.00 inches
Depth: 0.88 inches
Page Number: 177
List Price: $109.36
Product Code: P3
Est. Shipweight: 33.00 lbs.
NEMA Rating: N/A
Edge Flanges: Four
Configuration: C

Similar Partnumbers -

- SCE-30P20
- SCE-30P24
- SCE-30P30
- SCE-36P24
- SCE-36P30
- SCE-36P36
- SCE-40P24
- SCE-42P24
- SCE-42P36
- SCE-42P42
- SCE-48P24
- SCE-48P30
- SCE-48P36
- SCE-48P42
- SCE-54P42

Installation Information -

- Sub-Plate Layout & Grounding

Detailed Drawing
Downloadable Drawing (ZIP)

Having trouble downloading drawings? Click Here for help.

Finish -
Powder coated white epoxy polyester.

Options -
Sub-plates can be special ordered in Stainless Steel or Galvanized material. Please consult a factory representative for assistance.

FEDERAL SIGNAL CORPORATION

Vibratone® Horns

Models 350 and 450

The Models 350 and 450 Vibratone Horns produce a very loud horn tone by the electro-mechanical vibration of a diaphragm. Capable of reproducing coded blasts or sustained tones, Federal Signal's Vibratone horn is excellent for general alarm, start and dismissal, coded paging, and process control signaling in areas of high ambient noise levels.

The Vibratone Model 350 is available in AC voltages; 12VAC, 24VAC, 120VAC and 240VAC. The Model 350 produces 100dB @ 10', except the 12VAC model, which produces 94dB @ 10'.

The Model 450 is available in DC voltages; 12VDC, 24VDC, 125VDC and 250VDC. The Model 450 produces 99dB @ 10'.

Vibratone mounting options provide for surface, flush or semi-flush mounting on walls, panels, in cabinets, on 4-inch square outlet boxes, or in concrete and deep wall constructions.

Installed on the front of a Vibratone Horn, the optional Model PR Projector or Model PR2 Double Projector direct sound output straight ahead or to the sides, optimizing sound output for long, narrow rooms or corridors.

Vibratone horns are UL Listed, cUL Listed, CSA Certified and FM Approved. They are designed and approved for use in Type 4X applications when installed with the Panel Mount Gasket Kit or Weatherproof Backbox (Model WB). They are approved for Type 4X and Type 12 applications when installed with the Surface Mount Trim Ring (Model TR, illustrated on page 124).

Each Vibratone horn is enclosed in a zinc die-cast housing and sealed with grey powder-coat paint. The Model 350 features a stainless steel diaphragm. The Model 450 utilizes an aluminum diaphragm and heavy duty contacts. The rugged construction of the Vibratone horns resists vandalism and the effects of harsh industrial environments.

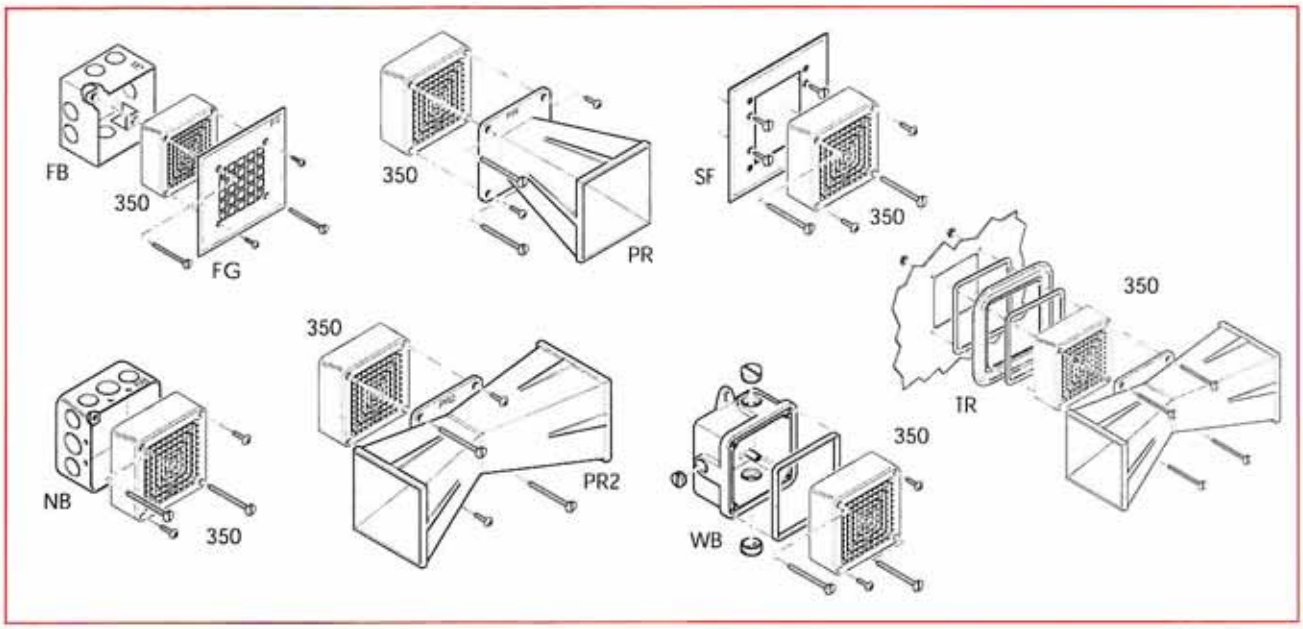
Compact size, loud output and heavy-duty construction make the VibraTone horns ideal for industrial and institutional signaling applications.

DESIGNED FOR ROUTINE SIGNALING

- Range of up to 200 feet (61m)
- Coded or sustained tones
- Model 350 – 12, 24, 120 and 240VAC; Model 450 – 12, 24, 125 and 250VDC
- Model 350 produces 100dB at 10' (110dB at 1 m); Model 450 produces 99dB at 10' (109dB at 1 m)
- UL and cUL Listed, CSA Certified, FM Approved
- Type 4X when installed with Panel Mount Gasket Kit or Weatherproof Backbox (Model WB); Type 4X and Type 12 when installed with Surface Mount Trim Ring (Model TR)

Model	Voltage	Operating Current	Decibels @ 10'	1m
350	12VAC 50/60Hz	0.90 amps	94	104
350	24VAC 50/60Hz	0.90 amps	100	110
350	120VAC 50/60Hz	0.18 amps	100	110
350	240VAC 50/60Hz	0.09 amps	100	110
450	12VDC	0.50 amps	99	109
450	24VDC	0.25 amps	99	109
450	125VDC	0.05 amps	99	109
450	250VDC	0.03 amps	99	109

VIBRATONE® HORNS (350/450)



OPTIONS

FB	Wall box for flush mounting the Vibratone® horn in stud, 4" block, or other shallow wall construction; 4⅜" square box; 2⅛" deep; shipping weight 2 lbs. (0.91 kg)
FBL	Same as FB, but 3$^{13}/_{16}$" deep for 6" x 8" concrete block, cinder block or other deep wall construction; shipping wt. 3 lbs. (1.36 kg)
FG	Flush grille which attaches to the basic unit and serves as the cover of the plastered-in FB flush box; 6" H x 6" W x ⅛" D; shipping wt. 1 lb. (0.45 kg)
K8435666A	Optional Panel Mounting Gasket Kit includes a gasket and hardware for surface or flush mounting the horn for NEMA Type 4 applications.
NB	4" square box with ½" & ¾" knockouts for interior mountings; 1½" deep; shipping weight 1 lb. (0.45 kg)
PR	Projector which concentrates sound into a basic area when attached to the basic model 350/450 units; 4" H x 4" W x 6" D; shipping weight 1 lb. (0.45 kg)
PR2	Double projector directs sounds to both sides when attached to the basic model 350/450 units; ideal for use in hallways; 4" H x 11½" W x 4" D; shipping weight 2 lbs. (0,91 kg)
SF	Stamped surface plate used for installations on plastered-in 4" outlet switch boxes for semi-flush mountings; 6"H x 6" W x ½" D; shipping weight 1 lb. (0.45 kg)
TR	Gasketed trim ring allowing surface mount installations of 350/450 units while maintaining Type12 and Type4X rating of enclosure.
WB	Cast aluminum neoprene-gasketed weatherproof housing for outside use, complete with mounting lugs; tapped for ½", ¾" conduit; 4⅜" square box; 2" deep mounting lugs on 4½" centers; shipping weight 1 lb. (0.45 kg)

SPECIFICATIONS

Operating Temp.:	-65°F to 150°F	-54°C to 66°C
Net Weight:	1.4 lbs.	0.6 kg
Shipping Weight:	1.5 lbs.	0.7 kg
Height:	4.0"	102 mm
Width:	4.0"	102 mm
Depth:	2.5"	64 mm

HOW TO ORDER

- Specify model and voltage
- Specify options from list
- Please refer to Model Number Index 350/450 beginning on page 378

REPLACEMENT PARTS

Description	*Part Number*
Panel Mount Gasket Kit	K8435666A
Coil (120VAC only)	KFC1516C
Volume Control Kit	K8435663B

c3controls since 1976

series DS

Disconnect Switches

Have you been looking for a rugged line of Disconnect Switches? c3controls disconnect switches are the most durable and reliable on the market today.

Panel/Base-Mount, Door-Mount, and Fusible Disconnect Switches are available in a wide range of switch (ampere) ratings. In addition, we are excited to introduce our new line of Series DS2 Non-Fused Disconnect Switches for control panel and motor circuit disconnecting requirements. These new, more compact switches offer increased ratings up to 125A and 60HP at 480V (45kW at 400V), positive drive to open double break contacts, and are certified as Manual Motor Controllers Suitable as Motor Disconnects for installation in compliance with the NEC. c3controls Series DS2 Disconnect Switches are certified in accordance with UL and CSA standards and are CE marked for use and acceptance in global applications. A wide variety of operating handles are available with Type 1, 2, 3, 3R, 4/4X, 12 and 13, and IP65 ingress protection ratings for severe environments. We offer a wide variety of accessory modules for easy, custom configurations.

TECHNICAL DATA

CERTIFICATIONS

SERIES DS2 NON-FUSED

Conformity to Standards:	Certifications:
UL 508	UL Listed
CSA C22.2 No. 14	CSA Certified
IEC 60947-1, 60947-3	CE Marked (per EU Low Voltage Directive 73/23/EEC and 93/68/EEC)

ELECTRICAL RATINGS

Maximum Voltage:	UL/CSA: 600V AC, IEC: 690V AC
Maximum Operating Current:	25A ~ 125A
Maximum Operating Power:	15 ~ 60HP @ 460V (4 ~ 45kW @ 400V)

MAXIMUM SHORT CIRCUIT RATING

UL/CSA: 10kA with Class J and Class CC fuses.
IEC: 30kA with Type gL fuses

ENVIRONMENTAL RATINGS

Ingress Protection:	Type 1, 2, 3, 3R, 4/4X, 12 & 13, and IP65 & IP30
Ambient Operating Temperature:	-25 to 55° C (-13 to 131° F)

See page 14 for comprehensive electrical, mechanical, environmental, and construction specifications.

CERTIFICATIONS

NEMA NON-FUSED

Conformity to Standards:	Certifications:
UL 508	UL File #: E187641
CSA C22.2 No. 14	CSA #: LR47446-16

FUSIBLE

Conformity to Standards:	Certifications:
UL 98	UL File #: E195139
CSA C22.2 No. 4	CSA #: 201556

ELECTRICAL RATINGS

NEMA Non-Fused switches through 60A. Fusible switches through 200A.

INGRESS PROTECTION

NEMA Non-Fused Disconnect Switch Operating Handles: Type 1, 2, 3, 3R, 4/4X, 12 and 13, and IP65.
Fusible Disconnect Switch Operating Handles: Type 4/4X and Type 1.

TEMPERATURE RANGE

Ambient Storage Temperature: -40 to + 185° F (-40 to + 85° C)
Operating Temperature : +32 to + 131° F (0 to + 55° C)

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 4 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	$23.00
P	Panel/Base Mount	$25.00

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
25	25 Amp	—	$ 7.00	$ 14.00
30	32 Amp	$ 5.00	$13.00	$ 21.00
40	40 Amp	$19.00	$28.00	$ 37.00
60	63 Amp	$25.00	$36.00	$ 47.00
80	80 Amp (Panel/Base Mount Only)	$33.00	$46.00	$ 59.00
100	100 Amp (Panel/Base Mount Only)	$50.00	$66.00	$ 82.00
125	125 Amp (Panel/Base Mount Only)	$67.00	$87.00	$107.00

V. OPERATING HANDLE TYPE

CODE	DESCRIPTION	FOR CURRENT RATING CODES	LIST
	DOOR MOUNT HANDLES FOR DOOR MOUNT SWITCHES		
DHM	Round (Type 1, 2, 3, 3R, 4/4X, 12, 13, and IP65)	25 ~ 60	$15.50
DHG	Round (IP65)	25 ~ 60	$ 6.50
	DOOR MOUNT HANDLES FOR PANEL/BASE MOUNT SWITCHES		
PHM	Round (Type 1, 2, 3, 3R, 4/4X, 12, 13, and IP65)	25 ~ 125	$15.50
PHG	Round (IP65)	25 ~ 125	$ 6.50
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

VI. OPERATING HANDLE COLOR

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

VII. OPERATING SHAFT LENGTH

CODE	DESCRIPTION	LIST
(Blank)	Door Mount and Panel/Base Mount Switch with Integral Operating Handle	—
11	283mm (11.1") Operating Shaft for Panel/Base Mount Switch	$10.00

DISCOUNT SCHEDULE C

One line side terminal shield is provided as standard with the purchase of a 25A to 63A switch.

PANEL MOUNT DISCONNECT SWITCH WITH PHG HANDLE

DOOR MOUNT DISCONNECT SWITCH WITH DHG HANDLE

PANEL MOUNT DISCONNECT SWITCH WITH INTEGRAL SML HANDLE

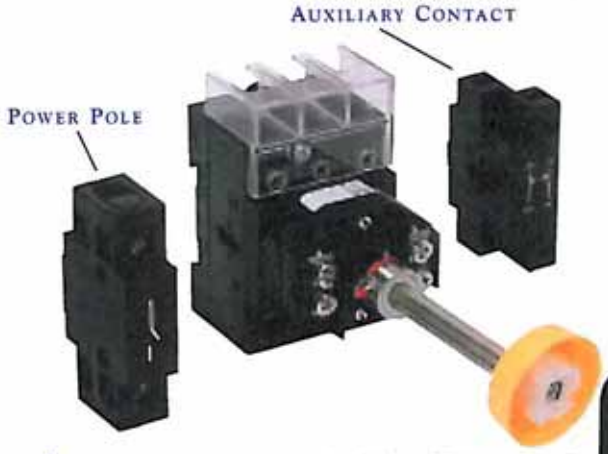
Series DS2 IEC Non-Fused Disconnect Switches

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 60HP at 480V (45kW at 400V). Panel/Base and door mounting options allow switches to be installed in virtually any enclosure.

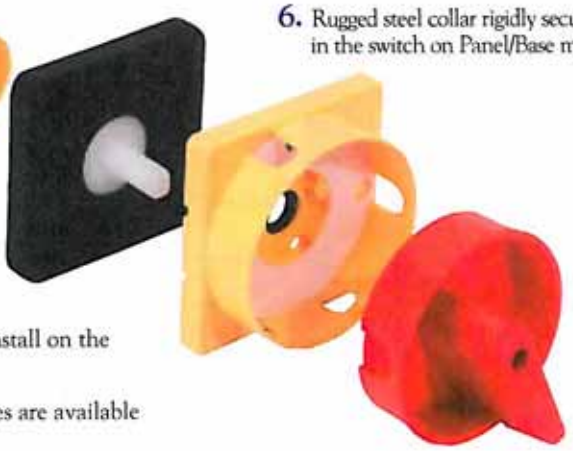
Panel/Base mount switches are simple to install:

- 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.

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



1. 5kA 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, 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, 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. Standard 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
DDS2-325-DHGRY	25A Door Mount Disconnect Switch w/3 Poles and Round Red/Yellow Operating Handle	$29.50
DDS2-330-DHGRY	32A Door Mount Disconnect Switch w/3 Poles and Round Red/Yellow Operating Handle	$34.50
DDS2-340-DHGRY	40A Door Mount Disconnect Switch w/3 Poles and Round Red/Yellow Operating Handle	$48.50
DDS2-360-DHGRY	63A Door Mount Disconnect Switch w/3 Poles and Round Red/Yellow Operating Handle	$54.50
PDS2-325-PHGRY	25A Panel Mount Disconnect Switch w/3 Poles and Round Red/Yellow Operating Handle	$31.50
PDS2-330-PHGRY	32A Panel Mount Disconnect Switch w/3 Poles and Round Red/Yellow Operating Handle	$36.50
PDS2-340-PHGRY	40A Panel Mount Disconnect Switch w/3 Poles and Round Red/Yellow Operating Handle	$50.50
PDS2-360-PHGRY	63A Panel Mount Disconnect Switch w/3 Poles and Round Red/Yellow Operating Handle	$56.50
PDS2-325-SMLBA	25A Panel Mount Disconnect Switch w/3 Poles and Integral Black/Aluminum Lever Handle	$29.00
PDS2-330-SMLBA	32A Panel Mount Disconnect Switch w/3 Poles and Integral Black/Aluminum Lever Handle	$34.00
PDS2-340-SMLBA	40A Panel Mount Disconnect Switch w/3 Poles and Integral Black/Aluminum Lever Handle	$48.00

Single Pole Distribution Blocks

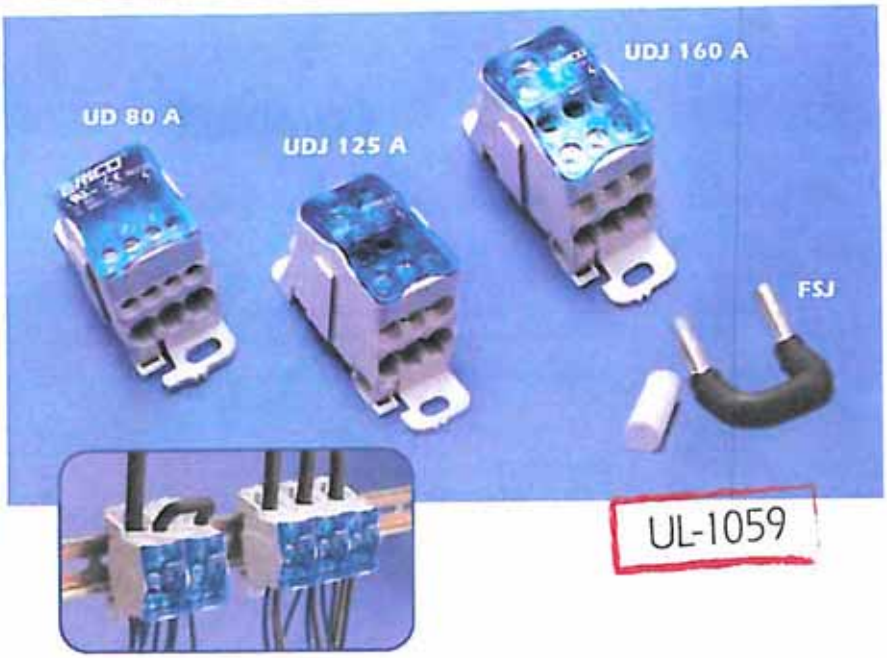
Compact

Part No.	DESCRIPTION		
560025	DB Hex Tool	1	0.80

UL® recognized for US and Canada (single pole only)
– UL 1059 - VO
– CSA® C22.2 NO. 158

Tested and certified according to IEC 60947-7-1

Single Pole Distribution Blocks

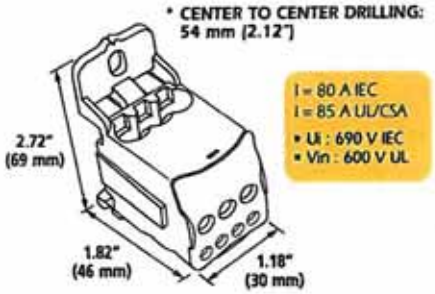


UL-1059

- Visual inspection of wire and confirmation of connection
- Halogen Free
- IP 20 finger safe
- 95% fill ratio
- Self extinguishing plastic v0
- Tinned copper blocks
- Electrical connection between two or more blocks, using jumper (UDJ 150 A & UDJ 200 A)
- Single Pole Distribution Blocks are UL recognized for 600 V AC maximum. File E198310

85 Amp - c UL us

- Modular: keeping only one input, the blocks can be supplied in parallel using a jumper wire. Easily double the neutral.

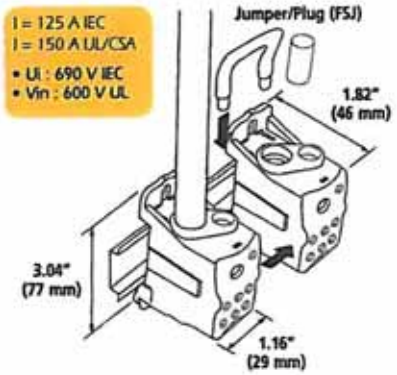


IMPERIAL AWG			Torque Inch/Lbs.
16...4	x1		19.5
16...8	x4		10.6
16...4	x2		19.5

Part No.	DESCRIPTION		
569010	UD 80 A	1	0.15

150 Amp - c UL us

- Modular: keeping only one input, the blocks can be supplied in parallel using a jumper. Easily double the neutral.



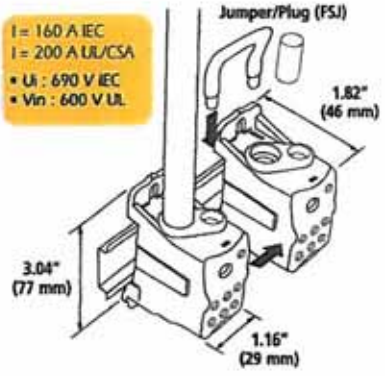
* CENTER TO CENTER DRILLING:
64 mm (2.53")

IMPERIAL AWG			Torque Inch/Lbs.
8...1/0	x1		57
14...2	x1		31
14...4	x6		31

Part No.	DESCRIPTION		
569020	UDJ 125 A	1	0.33
569150	FSJ	25	0.07

200 Amp - c UL us

- Modular: keeping only one input, the blocks can be supplied in parallel using a jumper. Easily double the neutral.



* CENTER TO CENTER DRILLING:
64 mm (2.53")

IMPERIAL AWG			Torque Inch/Lbs.
8...3/0	x1		75
14...2	x1		31
14...4	x6		31

Part No.	DESCRIPTION		
569030	UDJ 160 A	1	0.32
569150	FSJ	25	0.07

INDEPENDENTLY VERIFIED TO MEET SHORT CIRCUIT CURRENT RATING (SCCR) 100,000 AMP. UL 508A-2001 SUPPLEMENT "SB"

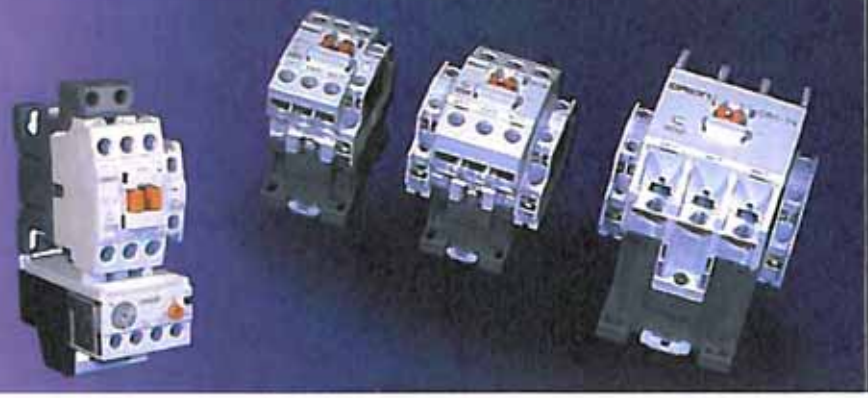
CRC Series

9 to 85A Magnetic Contactors

ORION

Best in Class Reliability Backed by a 5 Year Limited Warranty!
*Thanks to up to 2.5 million operations at full AC-3 current ratings, we match or beat the best in the industry. Our mechanical life designs are rated up to 25 million cycles!**

5 YEAR WARRANTY



CONTACTORS

Reliability for tough applications...rated up to 2.5 million cycles (electrical)**!

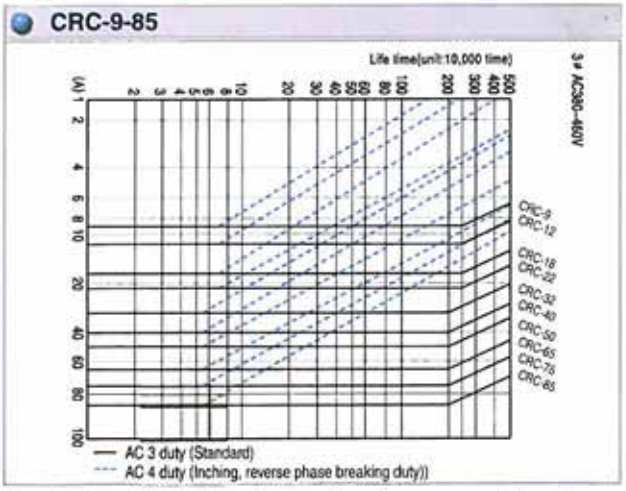
- Long-term reliability thanks to large contact surface areas, advanced metallurgy, and oversized magnetics
- Among highest current ratings in the industry for UL sizes

Quiet, reliable switching

- Heavy-duty construction eliminates buzzing and poor switching characteristics associated with inferior budget contactors

Easy installation

- Thermal overload matched for simple, direct connection without additional brackets
- Direct panel mount with screws or 35mm Standard DIN
- Finger-proof safety cover to help prevent fingers from touching connection points
- Class leading compact sizes



**Life varies by model. Consult endurance ratings. See www.cerusind.com for warranty terms.*

Versatile Thermal Overload Options

- Choose from electronic or bimetallic... direct mounting without brackets
- Bimetallic versions offer compact size (44mm), NO + NC trip contacts, differential current/phase protection, ambient compensation — 5° to 40°C, manual/ automatic reset

Reduced inventory carrying costs

- Pre-installed auxiliary contact included standard with each contactor (NO & NC)
- Common auxiliary contact and interlocks
- Common coil in 22AF & 40AF (CRC 9, 12, 18, 22, 32, 40)

Comprehensive line plus accessories

- Reversing, latching, 4-pole, DC contactors, 2-pole contactors, and capacitor contactors
- Full range of auxiliary contacts (front, side mounts), mechanical latches, interlocks, surge absorbers, timers and more!

CERUS INDUSTRIAL
The Direct Source for Motor Controls
Toll Free: 800-962-3787
Website: cerusind.com

ORDERING INFORMATION

3 & 4 Pole Versions Available
Ratings may vary for 4-pole

TYPE			CRC-9	CRC-12	CRC-18	CRC-22	CRC-32	CRC-40	CRC-50	CRC-65	CRC-75	CRC-85
UL 508	Rated thermal current (Ith)		20A	25A	30A	32A	45A	50A	70A	80A	90A	100A
	AC Motor	Single phase 115V	0.5hp	0.5 HP	1 HP	2 HP	2 HP	3 HP	3 HP	5 HP	5 HP	7.5 HP
		Single phase 230V	1 HP	2 HP	3 HP	3 HP	5 HP	5 HP	7.5 HP	10 HP	15 HP	15 HP
		Three phase 200V	2 HP	3 HP	5 HP	7 HP	7.5 HP	10 HP	10 HP	15 HP	20 HP	25 HP
		Three phase 230V	2 HP	3 HP	5 HP	7.5 HP	10 HP	10 HP	15 HP	20 HP	25 HP	30 HP
		Three phase 460V	5 HP	7.5 HP	10 HP	10 HP	20 HP	25 HP	30 HP	40 HP	50 HP	50 HP
		Three phase 575V	7.5 HP	10 HP	15 HP	15 HP	20 HP	25 HP	30 HP	40 HP	50 HP	50 HP
	AC1 duty		20A	20A	25A	32A	50A	60A	80A	100A	110A	135A
IEC-60947	AC3 duty	200-240V	2.5kW 11A	3.5kW 13A	4.5kW 18A	5.5kW 22A	7.5kW 32A	11kW 40A	15kW 55A	18.5kW 65A	22kW 75A	25kW 85A
		380-440V	4kW 9A	5.5kW 12A	7.5kW 18A	11kW 22A	15kW 32A	18.5kW 40A	22kW 50A	30kW 65A	37kW 75A	45kW 85A
		500-550V	4kW 7A	7.5kW 12A	7.5kW 13A	15kW 22A	18.5kW 28A	22kW 32A	30kW 43A	33kW 60A	37kW 64A	45kW 75A
		690V	4kW 5A	7.5kW 9A	7.5kW 9A	15kW 18A	18.5kW 21A	22kW 25A	30kW 33A	37kW 47A	37kW 47A	45kW 52A
Endurance (x10,000 operations)			20A	25A	30A	32A	45A	50A	70A	80A	90A	100A
		Electrical	250	250	250	250	200	200	200	200	200	200
		Mechanical	2500	2500	2500	2500	1500	1500	1000	1000	1000	1000

Coil Voltage (V) — CRC-9 to CRC-85

AC coil	AC 60Hz	24VAC	48VAC	110VAC	120VAC	208VAC	220VAC	240VAC	277VAC	380VAC	440VAC	480VAC	600VAC
DC coil	DC	12VDC	24VDC	48VDC	100VAC	110VDC	125VDC	200VDC	220VDC	250VDC	20VDC	60VDC	80VDC

Accessories

Aux, S/W		
Mechanical Interlock		CAR-9
Mechanical Latch		CAL-9
Surge Absorber	Varistor	CAS-11, 12, 13, 14
	CR + Varistor	CAS-1, 2, 3, 4, 5, 6
Insulation Barrier		

CA-1
1NO + 1NC

CA-2
2NO
2NC
1NO + 1NC

CA-4
4NO
4NC
3NO + 1NC
1NO + 3NC
2NO + 2NC

Thermal Overload Relays

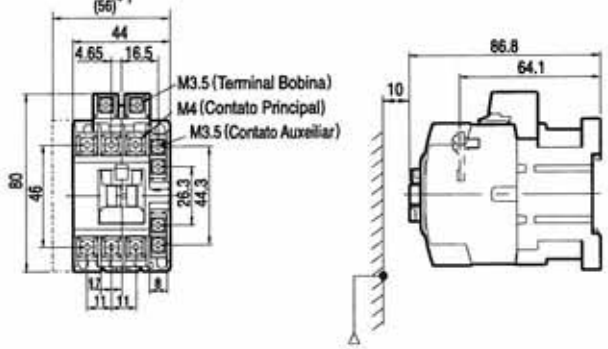
CTK-22

SELECTION [A]

0.1 - 0.16	2.5 - 4
0.16 - 0.25	4 - 6
0.25 - 0.4	5 - 8
0.4 - 0.63	6 - 9
0.63 - 1	7 - 10
1 - 1.6	9 - 13
1.6 - 2.5	12 - 18
	16 - 22

Separate Mounting Unit
CZ-22H

Dimension (inch)



CERUS INDUSTRIAL www.cerusind.com **Toll Free: 800-962-3787** 3101 SW 153rd Drive Suite 318 Beaverton, OR 97006

ORION
A CERUS INDUSTRIAL PRODUCT

Standard & High Break
Adjustable Thermal
Magnetic Trip

32, 63 & 100 AF Manual Motor Starters

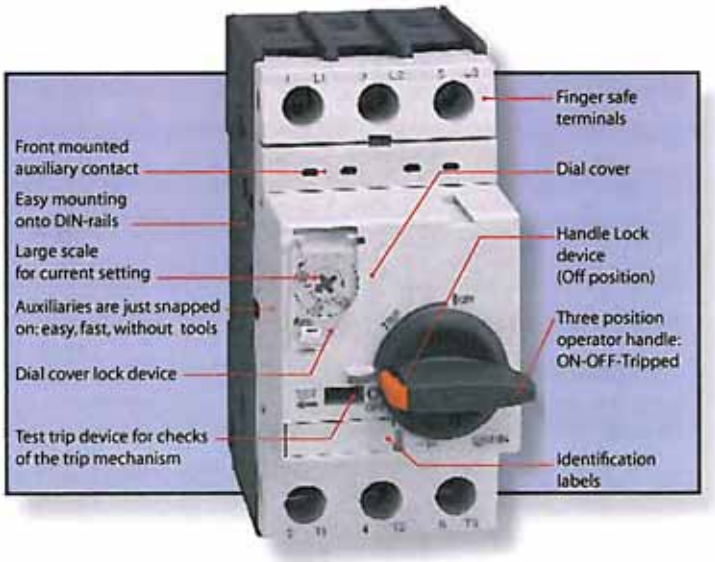
(circuit diagram)

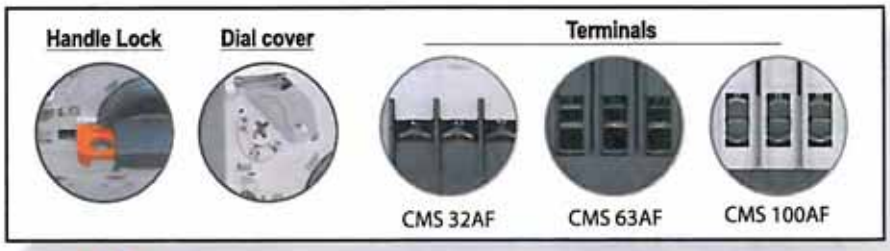
CE cULus

Maximum flexibility to comply with NEC 2005.
All Cerus CMS are UL type E and F rated with Cerus contactors, providing the highest interrupting ratings available.

Reliability and labor savings in a compact package!

- Compliance with the latest UL standards. Beginning in Jan 05, the NEC requires all motor control panels to include an interrupting rating. Only motor controllers rated UL Type F are in full compliance. All Cerus CMS are listed with Cerus contactors as UL Type F
- UL 508 Type E for group motor circuit protection … use for motor branch circuit protection without additional protection such as fuses or MCCBs‡
- UL 508 Type F self-protected combination controller when used with Cerus contactors
- Highest interrupting ratings of any manual motor starter - up to 65 KAIC in group motor applications
- Replaces overload relay, motor circuit protection & other associated components for controlling a single motor
- Full range of accessories … side/front auxiliary, alarm switches, shunt and under voltage releases
- Common accessories reduce inventory
- Standard and high-break versions
- All sizes are DIN rail mountable
- Wide temperature range -10°C to 60°C





Consult technical library at cerusind.com for detailed technical information

32, 63 & 100 AF Manual Motor Starters

Standard & High Break
Adjustable Thermal
Magnetic Trip

ORION
CERUS INDUSTRIAL PRODUCT

CMS-32S
H=3.70"
D=2.95"
W=1.77"

CMS-32H
H=3.70"
D=3.90"
W=1.77"

CMS-63H
H=5.51"
D=5.69"
W=2.17"

CMS-100H
H=6.50"
D=6.73"
W=2.76"

- Adjustable thermal release
- Magnetic release 13 x Ie max.
- Trip class 10
- Phase failure protection
- Ambient temperature compensation
- Standard break model features rocker switch operation; High break features rotary switch

32 AF Manual Motors

Rated operational current Ie (A)	Thermal release Adjustment range (A)	Magnetic release Operating current (A)	1-phase (HP) (60Hz)		3-phase (HP) (60Hz)			Standard					High break					Mag trip only	
			115V	230V	230V	460V	575V	UL Type E rated max short-circuit current* 240V kA	480V kA	600V kA	Part number ‡see note on page 22	List price	UL Type E rated max short-circuit current* 240V kA	480V kA	600V kA	Part number	List price	Part number	List price
0.16	0.1-0.16	2.1	-	-	-	-	-	100	50	10	CMS-32S-0.16	$49.07	100	65	25	CMS-32H-0.16	$68.97	CMS-32HI-0.16	$56.60
0.25	0.16-0.25	3.3	-	-	-	-	-	100	50	10	CMS-32S-0.25	$49.77	100	65	25	CMS-32H-0.25	$69.96	CMS-32HI-0.25	$57.47
0.4	0.25-0.4	5.2	-	-	-	-	-	100	50	10	CMS-32S-0.4	$49.79	100	65	25	CMS-32H-0.4	$69.98	CMS-32HI-0.4	$57.52
0.63	0.4-0.63	8.2	-	-	-	-	-	100	50	10	CMS-32S-0.63	$49.82	100	65	25	CMS-32H-0.63	$70.03	CMS-32HI-0.63	$57.52
1	0.63-1	13	-	-	-	-	1/2	100	50	10	CMS-32S-1	$50.19	100	65	25	CMS-32H-1	$70.55	CMS-32HI-1	$57.98
1.6	1-1.6	20.8	-	1/10	-	3/4	3/4	100	50	10	CMS-32S-1.6	$53.42	100	65	25	CMS-32H-1.6	$75.09	CMS-32HI-1.6	$63.03
2.5	1.6-2.5	32.5	-	1/6	1/2	1	1½	100	50	10	CMS-32S-2.5	$53.98	100	65	25	CMS-32H-2.5	$75.88	CMS-32HI-2.5	$63.71
4	2.5-4	52	1/8	1/3	3/4	2	3	100	50	5	CMS-32S-4	$57.97	100	65	25	CMS-32H-4	$81.48	CMS-32HI-4	$68.59
6	4-6	78	1/4	1/2	1½	3	5	100	25	5	CMS-32S-6	$57.98	100	65	25	CMS-32H-6	$81.50	CMS-32HI-6	$68.59
8	5-8	104	1/3	1	2	5	5	100	25	5	CMS-32S-8	$57.98	100	65	25	CMS-32H-8	$81.50	CMS-32HI-8	$68.59
10	6-10	130	1/2	1½	3	5	7½	50	10	5	CMS-32S-10	$57.98	100	65	25	CMS-32H-10	$81.50	CMS-32HI-10	$68.59
13	9-13	169	1/2	2	3	7½	10	50	10	5	CMS-32S-13	$57.98	100	65	25	CMS-32H-13	$81.50	CMS-32HI-13	$68.59
17	11-17	221	1	3	5	10	15	40	10	5	CMS-32S-17	$57.98	100	30	10	CMS-32H-17	$81.50	CMS-32HI-17	$68.59
22	14-22	286	1½	3	7½	15	20	30	10	5	CMS-32S-22	$57.98	100	30	10	CMS-32H-22	$81.50	CMS-32HI-22	$68.59
26	18-26	338	2	3	7½	15	20	30	7.5	5	CMS-32S-26	$57.98	100	30	10	CMS-32H-26	$81.50	CMS-32HI-26	$68.59
32	22-32	416	2	5	10	20	30	20	7.5	5	CMS-32S-32	$57.98	100	30	10	CMS-32H-32	$81.50	CMS-32HI-32	$68.59

63 AF Manual Motors

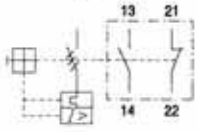
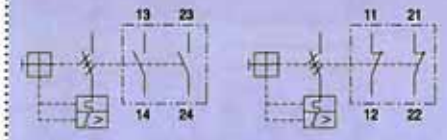
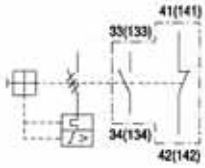
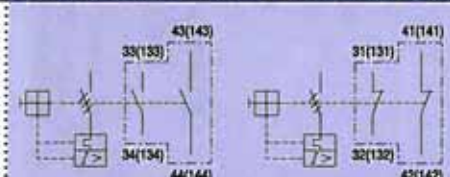
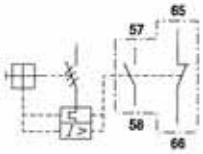
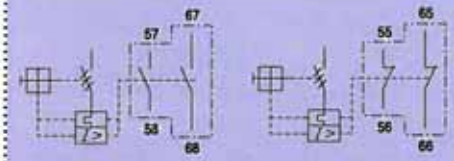
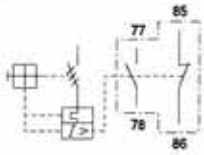
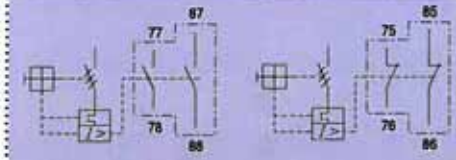
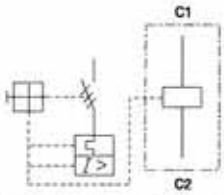
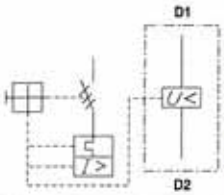
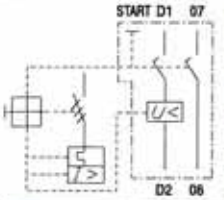
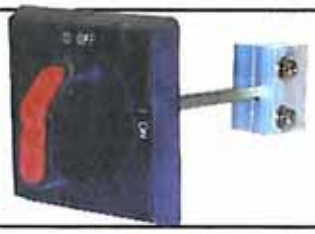
10	6-10	130	1/2	1½	3	5	7½	100	50	10	CMS-63S-10	$163.90	100	65	25	CMS-63H-10	$188.49	CMS-63HI-10	$161.67
13	9-13	169	1/2	2	3	7½	10	100	50	10	CMS-63S-13	$166.26	100	65	25	CMS-63H-13	$191.20	CMS-63HI-13	$161.64
17	11-17	221	1	3	5	10	15	100	40	10	CMS-63S-17	$166.26	100	50	10	CMS-63H-17	$191.20	CMS-63HI-17	$161.64
22	14-22	286	1½	3	7½	15	20	100	40	10	CMS-63S-22	$166.26	100	50	10	CMS-63H-22	$191.20	CMS-63HI-22	$161.64
26	18-26	338	2	3	7½	15	20	100	40	10	CMS-63S-26	$166.26	100	50	10	CMS-63H-26	$191.20	CMS-63HI-26	$161.64
32	22-32	416	2	5	10	20	30	100	40	10	CMS-63S-32	$166.26	100	50	10	CMS-63H-32	$191.20	CMS-63HI-32	$161.64
40	28-40	520	3	7½	10	30	30	100	40	10	CMS-63S-40	$166.26	100	50	10	CMS-63H-40	$191.20	CMS-63HI-40	$161.64
50	34-50	650	3	10	15	30	40	100	40	10	CMS-63S-50	$166.26	100	50	10	CMS-63H-50	$191.20	CMS-63HI-50	$161.64
63	45-63	819	5	10	20	40	60	100	40	10	CMS-63S-63	$166.26	100	50	10	CMS-63H-63	$191.20	CMS-63HI-63	$161.64

100 AF Manual Motors

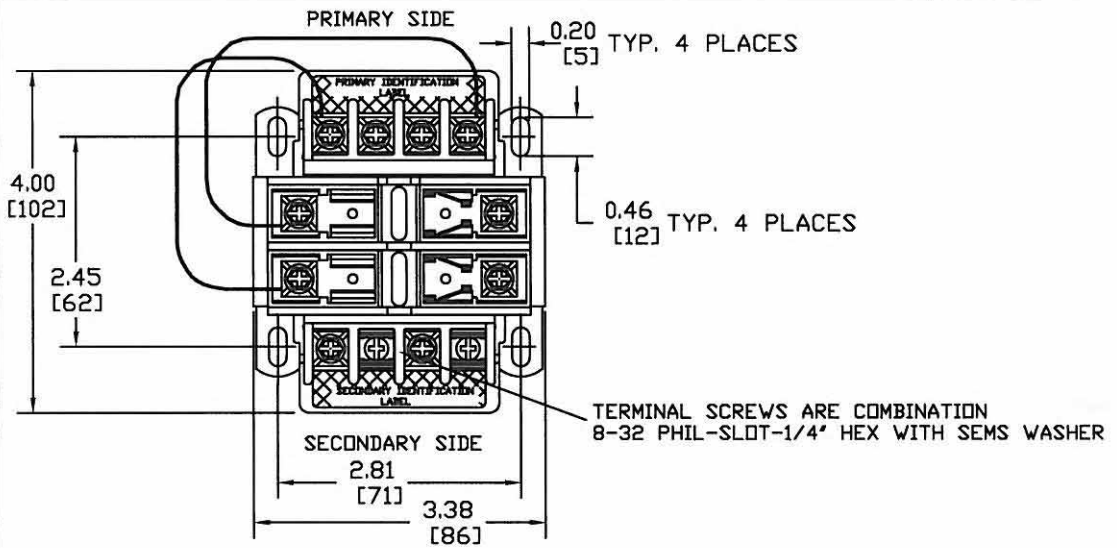
17	11-17	221	1	3	5	10	15	100	50	10	CMS-100S-17	$270.74	100	65	25	CMS-100H-17	$311.36	CMS-100HI-17	$263.52
22	14-22	286	1½	3	7½	15	20	100	50	10	CMS-100S-22	$270.74	100	65	20	CMS-100H-22	$311.35	CMS-100HI-22	$263.51
26	18-26	338	2	3	7½	15	20	100	50	10	CMS-100S-26	$270.74	100	65	20	CMS-100H-26	$311.35	CMS-100HI-26	$263.51
32	22-32	416	2	5	10	20	30	100	50	10	CMS-100S-32	$270.74	100	65	20	CMS-100H-32	$311.35	CMS-100HI-32	$263.51
40	28-40	520	3	7½	10	30	30	100	50	10	CMS-100S-40	$270.74	100	65	20	CMS-100H-40	$311.35	CMS-100HI-40	$263.51
50	34-50	650	3	10	15	30	40	100	50	10	CMS-100S-50	$277.29	100	65	20	CMS-100H-50	$318.88	CMS-100HI-50	$263.51
63	45-63	819	5	10	20	40	60	100	40	10	CMS-100S-63	$277.29	100	50	10	CMS-100H-63	$318.88	CMS-100HI-63	$263.51
75	55-75	975	5	15	25	50	60	100	40	10	CMS-100S-75	$277.29	100	50	10	CMS-100H-75	$318.88	CMS-100HI-75	$263.51
90	70-90	1170	7½	20	30	60	75	100	40	10	CMS-100S-90	$277.29	100	50	10	CMS-100H-90	$318.88	CMS-100HI-90	$263.51
100	80-100	1300	10	20	30	75	100	100	40	10	CMS-100S-100	$277.29	100	50	10	CMS-100H-100	$318.88	CMS-100HI-100	$263.51

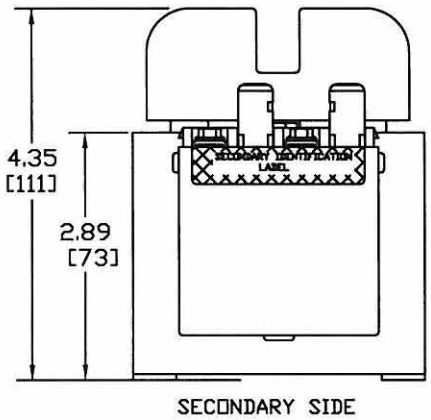
**UL rating for manual motor controller-group ratings.*
Manual motor starter ratings may be lower, see www.cerusind.com.

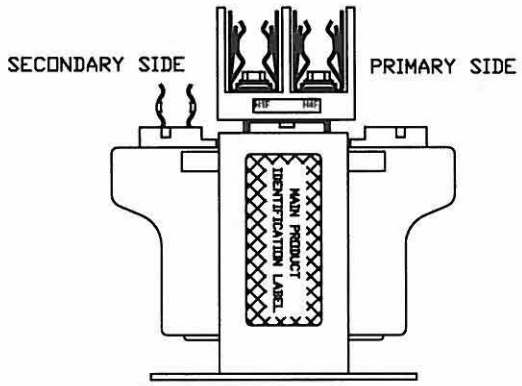
‡CMS-32s are UL listed as a manual motor controller only, and are not UL Type E, manual self protected combination motor controller.

Connection diagram	Description
Optional connections	
1NO1NC   Please consult factory for optional connections	**Auxiliary Switch** ■ Front mounting ■ 2-pole (1NO, 1NC) ■ One front mounting module per circuit breaker **FX-1NO-1NC**.....**$14.82** 
  Please consult factory for optional connections	**Auxiliary Switch** ■ Side mounting on the left ■ 2-pole (1NO, 1NC) ■ One side mounting module per circuit breaker **LX-1NO-1NC**.....**$22.43** 
  Please consult factory for optional connections	**Any Trip Alarm Switch** ■ Side mounting on the left ■ 2-pole (1NO, 1NC) ■ One side mounting module per circuit breaker (Always directly fitted to the circuit breaker) **LA-1NO-1NC**.....**$23.38** 
  Please consult factory for optional connections	**Magnetic Trip Alarm Switch** ■ Side mounting on the left ■ 2-pole (1NO, 1NC) ■ One side mounting module per circuit breaker (Always directly fitted to the circuit breaker except using with Any Trip Alarm Switch) **LAM-1NO-1NC**.....**$23.38** 
Voltage ratings	
 24V 50Hz / 28V 60Hz 110-127V 50Hz / 120V 60Hz 220-230V 50Hz / 240-260V 60Hz 240V 50Hz / 277V 60Hz 380-400V 50Hz / 440-460V 60Hz 415-440V 50Hz / 460-480V 60Hz	**Shunt Release** ■ Side mounting on the right ■ One side mounting module per circuit breaker (Always directly fitted to the circuit breaker) **RS-***(specify voltage rating - see chart at left)*.....**$35.01** 
 24V 50Hz / 28V 60Hz 110-127V 50Hz / 120V 60Hz 220-230V 50Hz / 240-260V 60Hz 240V 50Hz / 277V 60Hz 380-400V 50Hz / 440-460V 60Hz 415-440V 50Hz / 460-480V 60Hz	**Undervoltage Release** ■ Side mounting on the right ■ One side mounting module per circuit breaker (Always directly fitted to the circuit breaker) **RU-***(specify voltage rating - see chart at left)*.....**$35.20** 
 24V 50Hz / 28V 60Hz 110-127V 50Hz / 120V 60Hz 220-230V 50Hz / 240-260V 60Hz 240V 50Hz / 277V 60Hz 380-400V 50Hz / 440-460V 60Hz 415-440V 50Hz / 460-480V 60Hz	**Undervoltage Release with Release** ■ Side mounting on the right ■ Include 2NO Auxiliary contact ■ One side mounting module per circuit breaker (Always directly fitted to the circuit breaker) **RUX-***(specify voltage rating - see chart at left)*.....**$44.79** 
Through the door operator ■ Type 1, 12 and 3R rated ■ Locking mechanism (defeatable) ■ 5MM square shaft ■ Standard length - 180MM (longer lengths available) **TDO**.....**$80.15**	

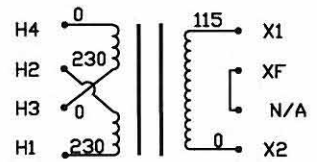
Item #







Transformer Specifications	
PRIMARY VOLTAGE(S)	230x460 (TRIPLE RATED)
SECONDARY VOLTAGE(S)	115
RATED V.A.	100
RATED FREQUENCY	50/60
INSULATION CLASS	105
AGENCY APPROVALS	UL,CUL
ESTIMATED WEIGHT	4.4 LBS

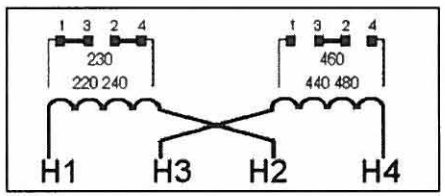


INTERNALLY JUMPERED TO FUSE TERMINAL

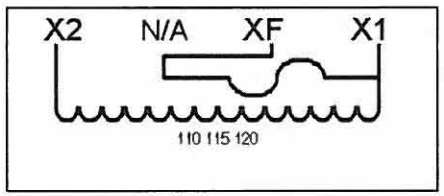
CONNECTION DIAGRAM

NOTE:
1. TORQUE CONNECTIONS TO 16 LB-IN
2. FUSE CLIPS TO ACCOMADATE 13/32-1 1/2"
3. ALL MEASURMENTS IN INCHES (MM)

PRIMARY IDENTIFICATION LABEL



SECONDARY IDENTIFICATION LABEL



MAIN PRODUCT IDENTIFICATION LABEL

MICRON CONTROL TRANSFORMERS
800 664-4660
www.MicronTransformers.com
ImperviTRAN
U.S. PAT. NO 3516040
100VA 50/60Hz
TEMP CL. 105°C
c UL us Listed 702X
CAT NO B100BTZ13RB
SERIES 2
05082

PACKAGED ACCESSORIES	
1	PAIR OF J2 JUMPERS
–	–
–	–

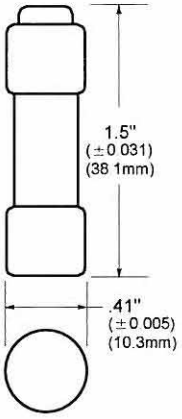
MICRON CONTROL TRANSFORMERS
MICRON INDUSTRIES CORPORATION
777 CHURCH ROAD - ELMHURST, IL 60126
Tel. (630)941-7600 (800)664-4660 Fax (630)941-8689
www.MicronTransformers.com

DATE	DRAWN	CHECKED	APPROVED
1/16/07	J.G.V		
RELEASE DATE	CUSTOMER PART NO.		
MICRON PART NO.			
SIZE C	SCALE NONE	B100BTZ13RB	

CC-TRON®
Time-Delay Fuses
13/32" x 1½", 600 Volt, ¼ to 30 Amps

FNQ-R

Dimensional Data



General Information:

- The Bussmann CC-TRON® (FNQ-R) was designed to meet the needs of control circuit transformer protection.
- Current-limitation protects down stream components against damaging thermal and magnetic effects of short-circuit currents.
- **High inrush time-delay.** Control circuit transformers can experience inrush currents up to 85 times their full-load current rating. FNQ-R fuses can be sized according to NEC and UL requirements and still allow the high inrush currents, with significantly more time-delay than the UL minimum value of 12 seconds at 200% for Class CC fuses.
- Melamine tube. Nickel-plated brass endcaps.

Catalog Symbol: FNQ-R
Time-Delay
Application: Circuit Transformer Protection
Ampere Rating: ¼ to 30A
Voltage Rating: 600Vac (or less)†
Interrupting Rating: 200,000A RMS Sym. (UL)
Agency Information:
UL Listed, Std. 248-4, Class CC, Guide JDDZ, File E4273
CSA Certified, Class CC CSA, Class 1422-01,
File 53787–HRC-MISC

†12-30A is 300Vdc and 10k AIR.

Maximum Acceptable Rating of Overcurrent Device*

Rated Primary Current (Amperes)	Maximum Rating of Overcurrent Protective Device Expressed As A Percent of Transformer Primary Current Rating
Less than 2A	500**
2A to less than 9A	167
9A or more	125

*UL 508A Table 42.1.
**300% for other than motor control applications.

CE CE logo denotes compliance with European Union Low Voltage Directive (50-1000Vac, 75-1500Vdc). Refer to Data Sheet: 8002 or contact Bussmann Application Engineering at 636-527-1270 for more information.

Electrical Ratings (Catalog Symbol and Amperes)

FNQ-R-¼	FNQ-R-1 3/10	FNQ-R-3 3/10	FNQ-R-8
FNQ-R-3/10	FNQ-R-1 4/10	FNQ-R-3½	FNQ-R-9
FNQ-R-4/10	FNQ-R-1½	FNQ-R-4	FNQ-R-10
FNQ-R-½	FNQ-R-1 6/10	FNQ-R-4½	FNQ-R-12
FNQ-R-6/10	FNQ-R-1 8/10	FNQ-R-5	FNQ-R-15
FNQ-R-¾	FNQ-R-2	FNQ-R-5 6/10	FNQ-R-17½
FNQ-R-8/10	FNQ-R-2¼	FNQ-R-6	FNQ-R-20
FNQ-R-1	FNQ-R-2½	FNQ-R-6¼	FNQ-R-25
FNQ-R-1⅛	FNQ-R-2 8/10	FNQ-R-7	FNQ-R-30
FNQ-R-1¼	FNQ-R-3	FNQ-R-7½	—

Carton Quantity and Weight

Ampere Ratings	Carton Qty.	Weight* Lbs.	Weight* Kg.
¼-30	10	.200	.091

*Weight per carton

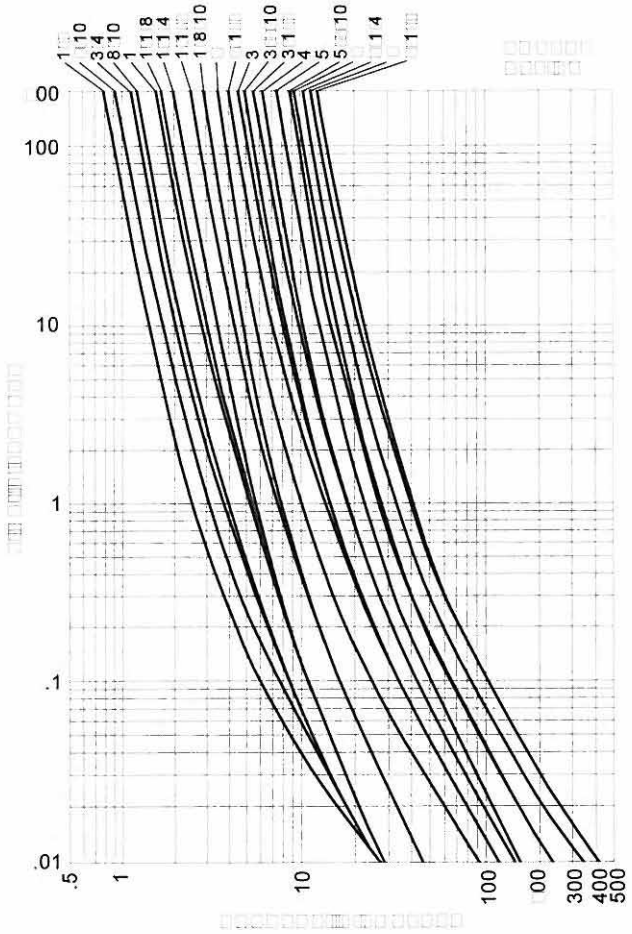
CC-TRON®

FNQ-R

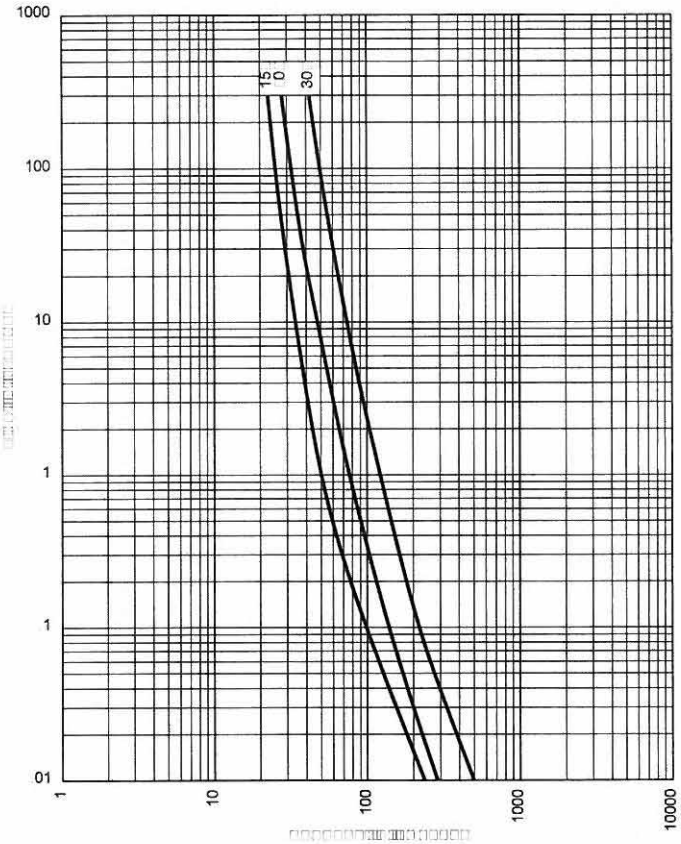
Time-Delay Fuses

13/32" x 1½", 600 Volt, ¼ to 30 Amps

Time-Current Characteristics–Average Melt



Time-Current Characteristics–Average Melt



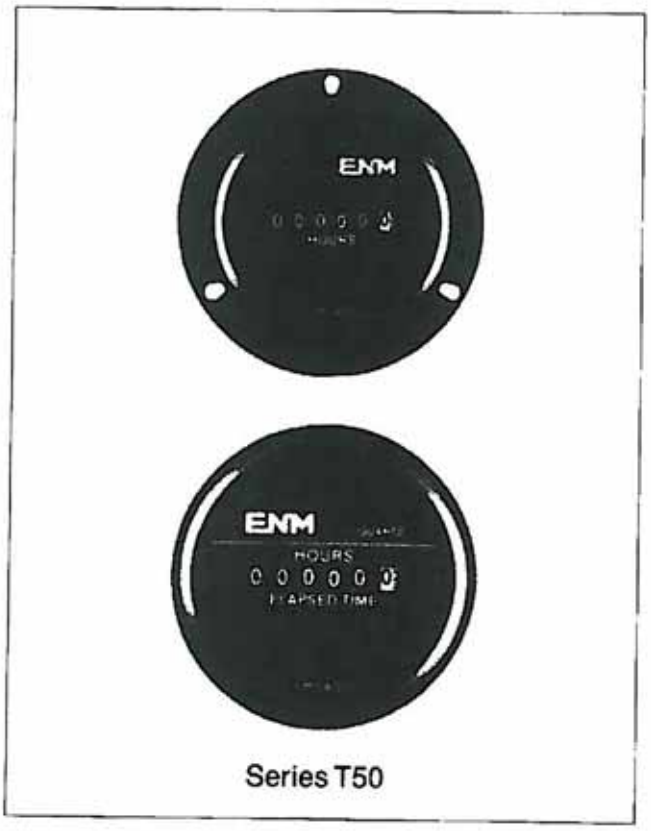
Recommended fuseblocks/fuseholders for Class CC 600V fuses

See Data Sheets listed below

- Open fuseblocks - 1105
- Finger-safe fuseholders - 1109, 1102, 1103, 1151
- Panel-mount fuseholders - 2114, 2113
- In-line fuseholders - 2126

Electronic Hour Meter Technical Data

AC Hour Meter, Series T50 211



Series T50

ENM's Series T50 electronic AC hour meter is a low cost reliable hour meter incorporating the latest state-of-the-art in electonics. It's quartz-crystal time base insures accurate long term time-keeping.

A reliable electromechanical wheel-type indicator is used to store accumulated hours.

This compact tamperproof meter is sealed against the environment to provide years of service.

The T50 elapsed time indicator was designed for use on test and recording equipment, for providing maintenance control, for establishing warranty programs, for measuring machine utilization and production time, or for any application where time-in-use is to be determined.

FEATURES:

- Solid State Electronic Circuit
- Quartz-Crystal for Accurate Timing
- Absolutely Will Not Lose Count
- High Impact, Tamperproof Plastic Case
- Sealed Against Moisture and Dirt
- UL and CSA Recognized
- Indicates Operating Time in Hours and Tenths
- Frequency Insensitive Design
- With Optional Gasket,complies to NEMA 4Xand 12
- **MADE IN THE USA**

SPECIFICATIONS:

Time Scale:	6-digits 99,999.9 Hours Automatic recycle to zero
Figures:	Hours — White on black Tenths — Red on White Height — 0.140"
Operating Voltage:	230,115,24V AC+10% Other Voltage available
Frequency:	50 or 60 Hz
Power Consumption:	Less than 0.4 Watts
Accuracy:	Better than ±0.02% over entire range
Temperature:	From -30° C to 65°
Vibration Resistance:	Withstands 10 to 75 hz at 1 to 8 g's
Termination:	1/4" male blade terminals
Configuration:	Round 3-hole Bezel Round SAE Bezel with new push-on retaining ring

E-MAIL
ENM Co. @ AOL.COM
Toll Free (888) 372-0465

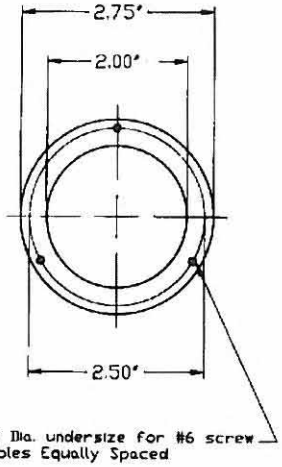
ENM Company
5617 Northwest Highway
Chicago, IL 60646-6135
(773) 775-8400 Fax: (773) 775-5968

Series T50 AC — Dimensional Data

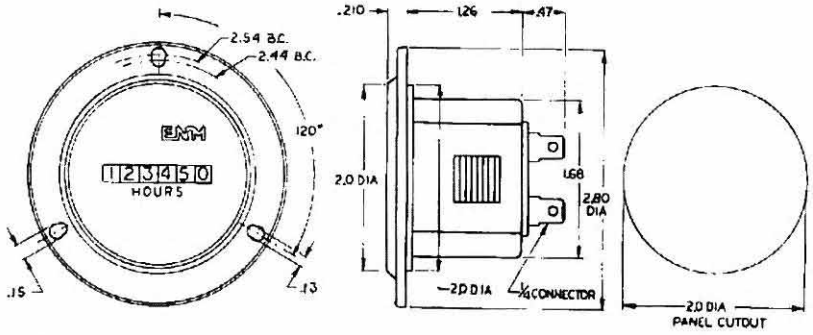
Panel Gasket
UL/NEMA 4X,12

Description	Part No.
NEMA Gasket	A40047-S

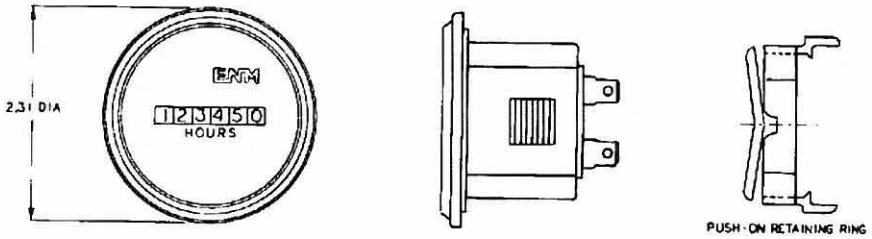
NEMA Gasket
w/ Mounting Hardware B20017



Round 3-Hole Bezel

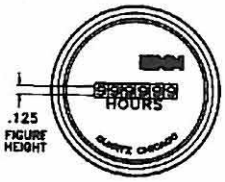


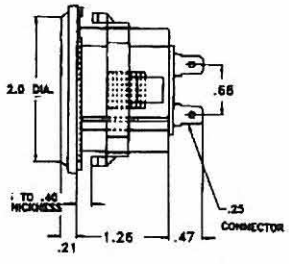
Round SAE Bezel

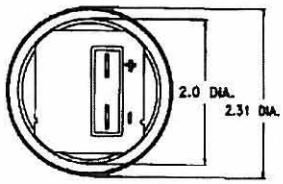


Power: Less than 0.4 Watts

Voltage	Part No.
230 AC	T50A1
115 AC	T50A2
24 AC	T50A4



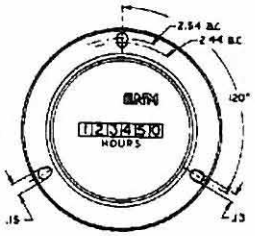


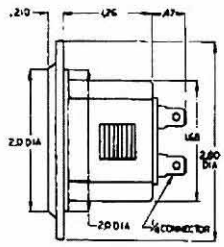


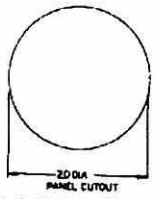
Technical Data Sheet #211

Power: Less than 0.4 Watts

Voltage	Part No.
230 AC	T50B1
115 AC	T50B2
24 AC	T50B4







Technical Data Sheet #211

Limited Warranty/Hour Meters

ENM Company hour meters are warranted to the consumer to be free from defects in material and workmanship for a period of 10,000 operating hours or for a period of 3 years, whichever first occurs.

All ENM products which fail within the warranty period due to defects in material or workmanship will be repaired or replaced, at ENM's option, without charge to the consumer when returned with proof of purchase to any authorized ENM dealer in the United States, transportation charges prepaid, provided there is no evidence of improper installation, tampering, or other abuse.

All implied warranties, including any implied warranty of merchantability or fitness for a particular purpose, shall be limited in duration to the express warranty period specified above.

ENM disclaims any liability for consequential damages due to breach of any written or implied warranty on its hour meters.

ENM Company
5617 Northwest Highway
Chicago, IL 60646-6135
(773) 775-8400 Fax: (773) 775-5968

c3controls™ since 1976

NEW!

c3controls is proud to introduce the new World line of IEC 22mm industrial pilot devices and controls.

Our line features illuminated and non-illuminated push buttons, uni-body and modular pilot lights, illuminated, non-illuminated and keyed selector switches as well as special operators and accessories. Each device is constructed from heavy duty polyester material for excellent durability and corrosion resistance. The modular design and easy to create assemblies provide simplicity in ordering and stocking products. All c3controls 22mm IEC operators are UL Listed and are rated Type 4/4X standard for watertight and corrosion resistance. In addition, operators are also listed for Types 1, 2, 3, 3R, 12, 13 and IP65 applications.

All of this, plus outstanding customer support and competitive pricing makes c3controls your best option for 22mm IEC pilot devices!

TECHNICAL DATA

CERTIFICATIONS

UL file #: E68568 All c3controls 22mm IEC products meet UL 508, CSA No. 14 and IEC 60947-5 product standards' requirements.

c(UL)us CE

ELECTRICAL RATINGS

Standard contact blocks are control circuit rated A600 heavy duty, 600 Volts continuous thermal, 10 Amperes, 7200VA make and 720VA break (AC).
The DC rating is Q600, 600 Volts continuous thermal, 2.5 Amperes, 69VA make and 69VA break.

ENVIRONMENTAL RATING

All c3controls 22mm IEC products are UL Listed and are rated for Types 1, 2, 3, 3R, 4/4X, 12, 13 and IP65 applications.

MECHANICAL DESIGN LIFE CYCLES

Push Buttons	Momentary: 5 Million	Maintained: 1 Million
Selector Switches	Non-Illuminated: 500,000	Illuminated: 200,000
Standard Contact Blocks	5 Million	
Pilot Lights	Refer to the Lamp Technical Data chart on page 81.	

TEMPERATURE RANGE

Storage Temperature: -40 to +70° C (85° C max. for 24 hours), -40 to +158° F (185° F max. for 24 hours)
Operating Temperature: -25 to +55° C (-13 to +131° F)

TERMINAL CAPACITY

#22 to #12 AWG (one or two wires per terminal)

IT'S EASY TO BUILD YOUR OWN PILOT LIGHT

Simply pick the code number from each of the sections below and combine them to build your part number. See page 2 for more detailed directions.

Unibody Pilot Lights

W22U – ____ . ____ – ____
I II III IV

Example: To build one of our most popular Pilot Lights, the part number would be W22U + II + III + IV or W22U-120LR-WLR

I. OPERATOR TYPE

CODE	DESCRIPTION	LIST
W22U	Unibody Light Unit	$4.50

II. VOLTAGE

CODE	DESCRIPTION
	FULL VOLTAGE
6	6V AC/DC
12	12V AC/DC
24	24V AC/DC
120	120V AC/DC

III. LAMP TYPE/COLOR

CODE	DESCRIPTION	LIST
	LED	
LA	Amber	$7.00
LB	Blue	$7.00
LG	Green	$7.00
LR	Red	$7.00
LW	White	$7.00
	INCANDESCENT	
I	Clear	—
F	Clear Flashing Bulb NOTE: Incandescent flashing bulbs available for any 6V full voltage application.	$4.00
NL	**No Lamp**	– $1.00

IV. LENS/COLOR

CODE	DESCRIPTION	LIST
WLA	Amber	$1.00
WLB	Blue	$1.00
WLC	Clear	$1.00
WLG	Green	$1.00
WLR	Red	$1.00
WLW	White	$1.00

SEE PAGE 81 FOR LAMP TECHNICAL DATA AND LAMP REPLACEMENT CHARTS.

DISCOUNT SCHEDULE C

AVAILABLE LENS COLORS FOR UNIBODY PILOT LIGHTS

c3controls™ since 1976

NEW!

c3controls is proud to introduce the new World line of IEC 22mm industrial pilot devices and controls.

Our line features illuminated and non-illuminated push buttons, uni-body and modular pilot lights, illuminated, non-illuminated and keyed selector switches as well as special operators and accessories. Each device is constructed from heavy duty polyester material for excellent durability and corrosion resistance. The modular design and easy to create assemblies provide simplicity in ordering and stocking products. All c3controls 22mm IEC operators are UL Listed and are rated Type 4/4X standard for watertight and corrosion resistance. In addition, operators are also listed for Types 1, 2, 3, 3R, 12, 13 and IP65 applications.

All of this, plus outstanding customer support and competitive pricing makes c3controls your best option for 22mm IEC pilot devices!

TECHNICAL DATA

CERTIFICATIONS
UL file #: E68568 All c3controls 22mm IEC products meet UL 508, CSA No. 14 and IEC 60947-5 product standards' requirements.

ELECTRICAL RATINGS
Standard contact blocks are control circuit rated A600 heavy duty, 600 Volts continuous thermal, 10 Amperes, 7200VA make and 720VA break (AC).
The DC rating is Q600, 600 Volts continuous thermal, 2.5 Amperes, 69VA make and 69VA break.

ENVIRONMENTAL RATING
All c3controls 22mm IEC products are UL Listed and are rated for Types 1, 2, 3, 3R, 4/4X, 12, 13 and IP65 applications.

MECHANICAL DESIGN LIFE CYCLES

Push Buttons	Momentary: 5 Million	Maintained: 1 Million
Selector Switches	Non-Illuminated: 500,000	Illuminated: 200,000
Standard Contact Blocks	5 Million	
Pilot Lights	Refer to the Lamp Technical Data chart on page 81.	

TEMPERATURE RANGE
Storage Temperature: -40 to +70° C (85° C max. for 24 hours), -40 to +158° F (185° F max. for 24 hours)
Operating Temperature: -25 to +55° C (-13 to +131° F)

TERMINAL CAPACITY
#22 to #12 AWG (one or two wires per terminal)

IT'S EASY TO BUILD YOUR OWN PUSH BUTTON

Simply pick the code number from each of the sections below and combine them to build your part number. See page 2 for more detailed directions.

Momentary Push Buttons (Non-Illuminated)

W22PB – ____ ____ – ____ / ____ / ____

I II III IV* V* VI*

Example: To build one of our most popular Push Buttons, the part number would be W22PB + II + III + IV + V + VI or W22PB-FG-10

*NOTE: Contact block configurations are based on circuit designation. If only two contact blocks are selected, they will be assembled in the left and right positions.

I. OPERATOR TYPE

CODE	DESCRIPTION	LIST
W22PB	Push Button Operator	$3.20

II. CAP TYPE

CODE	DESCRIPTION	LIST
F	Flush Cap	—
E	Extended Cap	—
G	Guarded Cap	$5.00
M	Mushroom Cap	$2.60
J	Jumbo Mushroom Cap	$3.80

III. CAP COLOR

CODE	DESCRIPTION
K	Black
B	Blue
G	Green
E	Grey
R	Red
W	White
Y	Yellow

IV. CONTACT BLOCK CONFIGURATION (LEFT SIDE)

CODE	DESCRIPTION	LIST
(Blank)	Operator without Contact Blocks	—
10	1 Normally Open Contact Block	$2.30
01	1 Normally Closed Contact Block	$2.30
E	1 "Early Make" Contact Block	$2.30
D	1 "Delayed Break" Contact Block	$2.30
20	2 Normally Open Contact Blocks	$4.60
02	2 Normally Closed Contact Blocks	$4.60
11	1 Normally Open and 1 Normally Closed Contact Blocks	$4.60

V. CONTACT BLOCK CONFIGURATION (CENTER)

(USE CHART IV FROM ABOVE)

VI. CONTACT BLOCK CONFIGURATION (RIGHT SIDE)

(USE CHART IV FROM ABOVE)

LEGEND PLATES *in almost any size & color are available for same day shipping.* *See pages 78-79 for complete selection.*

Some of Our Popular Configurations:

DISCOUNT SCHEDULE C

MOMENTARY NON-ILLUMINATED PUSH BUTTON OPERATORS

		FLUSH CAP		EXTENDED CAP	
	CAP COLOR	CATALOG NUMBER	LIST	CATALOG NUMBER	LIST
1 NO	Black	W22PB-FK-10	$5.50	W22PB-EK-10	$5.50
	Green	W22PB-FG-10	$5.50	W22PB-EG-10	$5.50
	Red	W22PB-FR-10	$5.50	W22PB-ER-10	$5.50
1 NC	Black	W22PB-FK-01	$5.50	W22PB-EK-01	$5.50
	Green	W22PB-FG-01	$5.50	W22PB-EG-01	$5.50
	Red	W22PB-FR-01	$5.50	W22PB-ER-01	$5.50
1 NO & 1 NC	Black	W22PB-FK-10/01	$7.80	W22PB-EK-10/01	$7.80
	Green	W22PB-FG-10/01	$7.80	W22PB-EG-10/01	$7.80
	Red	W22PB-FR-10/01	$7.80	W22PB-ER-10/01	$7.80

Mix and Match Any Color and Momentary Non-Illuminated Push Button Cap


Flush Cap


Extended Cap


Extended Cap

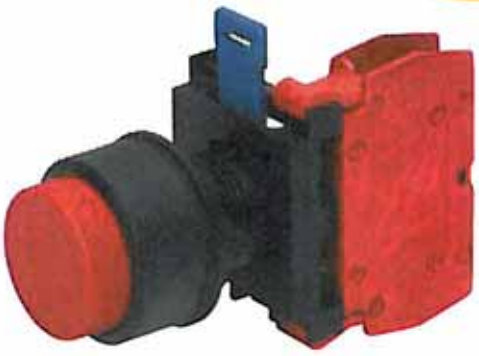

Guarded Cap


Mushroom Cap (40mm dia.)


Mushroom Cap (40mm dia.)


Jumbo Mushroom Cap (60mm dia.)

22mm IEC Momentary Non-Illuminated Push Buttons

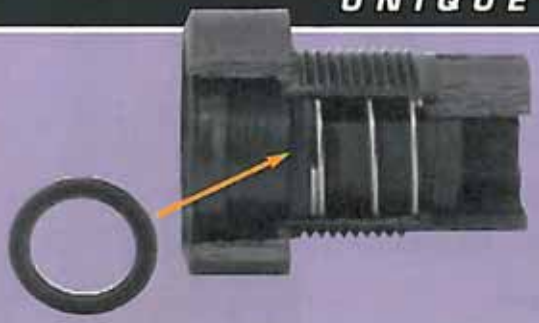


Our new line of 22mm IEC Momentary Non-Illuminated Push Buttons feature contact blocks that are stackable up to 2 deep and 3 across for a total of 6 circuits per operator. All c3controls 22mm IEC operators are UL Listed and are rated Type 4/4X standard for watertight and corrosion resistance. In addition, operators are also listed for Types 1, 2, 3, 3R, 12, 13 and IP65 applications.

Product features include:

- Polyester construction for superior corrosion resistance, moisture rejection and electrical insulation.
- Seven color options are available on five different cap types.
- Modular contact blocks use #6 steel plated terminal screws with self lifting captive wire clamps that accommodate #22 through two #12 AWG wires per terminal.
- Operators conveniently mount in a round 22.5mm or 7/8" hole that is directly interchangeable with competitors units and eliminate the labor required for notching.

UNIQUE PRODUCT FEATURES



Our revolutionary U-cup seal is infused with a Teflon coating to eliminate cracking when exposed to harsh conditions such as heat, dryness and sunlight. The U-Cup seal rides easily along the stroker and keeps water, oils, dust and other corrosive particles in the air away from the contact blocks. The U-Cup seal also acts like a squeegee and forms a permanent watertight seal that meets or exceeds Type 4/4X.

Item # 1

c3controls™ since 1978

NEW!

c3controls is proud to introduce the new World line of IEC 22mm industrial pilot devices and controls.

Our line features illuminated and non-illuminated push buttons, uni-body and modular pilot lights, illuminated, non-illuminated and keyed selector switches as well as special operators and accessories. Each device is constructed from heavy duty polyester material for excellent durability and corrosion resistance. The modular design and easy to create assemblies provide simplicity in ordering and stocking products. All c3controls 22mm IEC operators are UL Listed and are rated Type 4/4X standard for watertight and corrosion resistance. In addition, operators are also listed for Types 1, 2, 3, 3R, 12, 13 and IP65 applications.

All of this, plus outstanding customer support and competitive pricing makes c3controls your best option for 22mm IEC pilot devices!

TECHNICAL DATA

CERTIFICATIONS

UL file #: E68568 All c3controls 22mm IEC products meet UL 508, CSA No. 14 and IEC 60947-5 product standards' requirements.

c UL us CE

ELECTRICAL RATINGS

Standard contact blocks are control circuit rated A600 heavy duty, 600 Volts continuous thermal, 10 Amperes, 7200VA make and 720VA break (AC).
The DC rating is Q600, 600 Volts continuous thermal, 2.5 Amperes, 69VA make and 69VA break.

ENVIRONMENTAL RATING

All c3controls 22mm IEC products are UL Listed and are rated for Types 1, 2, 3, 3R, 4/4X, 12, 13 and IP65 applications.

MECHANICAL DESIGN LIFE CYCLES

Push Buttons	Momentary: 5 Million	Maintained: 1 Million
Selector Switches	Non-Illuminated: 500,000	Illuminated: 200,000
Standard Contact Blocks	5 Million	
Pilot Lights	Refer to the Lamp Technical Data chart on page 81.	

TEMPERATURE RANGE

Storage Temperature: -40 to +70° C (85° C max. for 24 hours), -40 to +158° F (185° F max. for 24 hours)
Operating Temperature: -25 to +55° C (-13 to +131° F)

TERMINAL CAPACITY

#22 to #12 AWG (one or two wires per terminal)

22MM IEC ILLUMINATED, NON-ILLUMINATED AND KEYED SELECTOR SWITCHES

c3controls new 22mm IEC Selector Switches come standard in two and three positions in either spring return or maintained in non-illuminated, illuminated and keyed versions. Each joins our 30mm and 22mm NEMA style family with a unique universal cam design. Our one cam and proper contact block sequence can perform the same functions as it takes for up to seven cams from our competitors units. Add our snap-on contact blocks and you can run up to four different circuits with just one selector switch. All c3controls 22mm IEC operators are UL Listed and are rated Type 4/4X standard for watertight and corrosion resistance. In addition, operators are also listed for Types 1, 2, 3, 3R, 12, 13 and IP65 applications.

The c3controls Illuminated Selector Switches utilize full voltage, transformer and resistor light units that come standard in a wide range of voltages. LED and Incandescent lamps offer long life and outstanding light output. Using an illuminated selector switch can free up valuable space on a control panel by eliminating the need for an additional pilot light. Additionally, our illuminated handles are available in six different colors.

Product features include:

- Polyester construction for superior corrosion resistance, moisture rejection and electrical insulation.
- Modular contact blocks use #6 steel plated terminal screws with self lifting captive wire clamps that accommodate #22 through two #12 AWG wires per terminal.
- Operators conveniently mount in a round 22.5mm or 7/8" hole that is directly interchangeable with competitors units and eliminate the labor required for notching.

KEYED SWITCH FEATURES

Alternate Key Combinations: Up to 9 different key combinations (CC series) are available. To order locks keyed differently, please consult factory or specify on order and increase the price $28.00 per operator.

Master Keys: A master key is available that works in all 9 CC series key combinations. To order, please consult factory or specify master keys on order and increase the price $16.00 per set of two master keys.

Extra or Replacement Keys: Available upon request, please consult factory.

HANDLE OR KEY POSITIONS

2-POSITION	3-POSITION
	

UNIQUE PRODUCT FEATURES

SAVE TIME & MONEY - WITH C3CONTROLS, ONE CAM DOES IT ALL!

1. One-Cam does it all vs. our competitors who need up to seven cams to perform the same function. This One-Cam design eliminates the need for multiple cam configurations and selector switch configuration nightmares, saving time, inventory, money, and ensuring 100% cam selection configuration accuracy.
2. Full Voltage, Transformer and Resistor light units available in a wide range of voltages and can be used with LED and Incandescent lamps.
3. Compact, thin design for fitting into tight spaces.

O = OPEN X = CLOSED

CONTACT BLOCK SELECTION FOR 2-POSITION SELECTOR SWITCHES

CIRCUIT DESIG.	HANDLE POSITION LEFT	HANDLE POSITION RIGHT	BLOCK CATALOG NUMBER	MOUNTING POSITION
H	O	X	WNO	EITHER
G	X	O	WNC	EITHER

CONTACT BLOCK SELECTION FOR 3-POSITION SELECTOR SWITCHES

CIRCUIT DESIG.	HANDLE POSITION LEFT	HANDLE POSITION CENTER	HANDLE POSITION RIGHT	BLOCK CATALOG NUMBER	MOUNTING POSITION
A	X	O	O	WNO	LEFT
B	O	X	O	WNC	EITHER
C	O	O	X	WNO	RIGHT
D	O	X	X	WDB	LEFT
E	X	O	X	WEM	EITHER
F	X	X	O	WDB	RIGHT

IT'S EASY TO BUILD YOUR OWN SELECTOR SWITCH

Simply pick the code number from each of the sections below and combine them to build your part number. See page 2 for more detailed directions.

Selector Switches (Non-Illuminated)

W22 ____ – ____ ____ – ____ / ____
I II III IV V* VI*

*NOTE: Contact block configurations are based on circuit designations (see page 75 for circuit designation charts).

Example: To build one of our most popular Selector Switches, the part number would be W22 + II + III + IV + V + VI or W22S2R-HW-01

I. OPERATOR TYPE

CODE	DESCRIPTION	LIST
W22	Selector Switch	$3.70

II. BASIC SELECTOR SWITCH OPERATOR FUNCTION

CODE	POS./FUNCTION	LIST
S2	2/Maintained, L	—
S2R	2/Maintained, R	—
SRL	2/Spring Return, R to L	$0.90
SLR	2/Spring Return, L to R	$0.90
S3	3/Maintained	—
SLC	3/Spring Return, L to C	$0.90
SRC	3/Spring Return, R to C	$0.90
SAC	3/Spring Return, L & R to C	$0.90

III. HANDLE TYPE

CODE	DESCRIPTION	LIST
H	Standard Handle	$1.60

IV. HANDLE INSERT COLOR

CODE	DESCRIPTION
B	Blue
G	Green
E	Grey
R	Red
W	White
Y	Yellow

Each operating handle is black with a factory assembled color insert.

V. CONTACT BLOCK CONFIGURATION (LEFT SIDE)

CODE	DESCRIPTION	LIST
(Blank)	Operator without Contact Blocks	—
10	1 Normally Open Contact Block	$2.30
01	1 Normally Closed Contact Block	$2.30
E	1 "Early Make" Contact Block	$2.30
D	1 "Delayed Break" Contact Block	$2.30
20	2 Normally Open Contact Blocks	$4.60
02	2 Normally Closed Contact Blocks	$4.60
11	1 Normally Open and 1 Normally Closed Contact Blocks	$4.60

VI. CONTACT BLOCK CONFIGURATION (RIGHT SIDE)

(USE CHART V FROM ABOVE) 10

DISCOUNT SCHEDULE C

SOME OF OUR POPULAR CONFIGURATIONS:

2-POSITION NON-ILLUMINATED SELECTOR SWITCHES

CONTACT SYMBOL	CONTACT BLOCK MOUNTING POS. Viewed from front of operator	HANDLE POSITION 0=OPEN X=CLOSED LEFT	HANDLE POSITION 0=OPEN X=CLOSED RIGHT	TYPE OF OPERATOR	MAINTAINED POSITION CATALOG #	MAINTAINED POSITION LIST	SPRING RETURN-RIGHT TO LEFT CATALOG #	SPRING RETURN-RIGHT TO LEFT LIST	SPRING RETURN-LEFT TO RIGHT CATALOG #	SPRING RETURN-LEFT TO RIGHT LIST
1 NO	EITHER	0	X	Standard	W22S2-HW-10	$7.60	W22SRL-HW-10	$9.50	W22SLR-HW-10	$8.50
1 NC	EITHER	X	0	Standard	W22S2-HW-01	$7.60	W22SRL-HW-01	$8.50	W22SLR-HW-01	$8.50

3-POSITION NON-ILLUMINATED SELECTOR SWITCHES

CONTACT SYMBOL	CONTACT BLOCK MOUNTING POS. Viewed from front of operator	HANDLE POSITION 0=OPEN X=CLOSED LEFT	CENTER	RIGHT	TYPE OF OPERATOR	MAINTAINED POSITION CATALOG #	MAINTAINED POSITION LIST	SPRING RETURN-LEFT TO CENTER CATALOG #	SPRING RETURN-LEFT TO CENTER LIST	SPRING RETURN-RIGHT TO CENTER CATALOG #	SPRING RETURN-RIGHT TO CENTER LIST	SPRING RETURN-ALL EITHER TO CENTER CATALOG #	SPRING RETURN-ALL EITHER TO CENTER LIST
NO/NO	LEFT	X	0	0	Standard	W22S3-HW-10/10	$9.90	W22SLC-HW-10/10	$10.80	W22SRC-HW-10/10	$10.80	W22SAC-HW-10/10	$10.80
	RIGHT	0	0	X									

AVAILABLE HANDLE INSERT COLORS FOR NON-ILLUMINATED SELECTOR SWITCHES

22mm IEC Momentary Non-Illuminated Push Buttons

Our new line of 22mm IEC Momentary Non-Illuminated Push Buttons feature contact blocks that are stackable up to 2 deep and 3 across for a total of 6 circuits per operator. All c3controls 22mm IEC operators are UL Listed and are rated Type 4/4X standard for watertight and corrosion resistance. In addition, operators are also listed for Types 1, 2, 3, 3R, 12, 13 and IP65 applications.

Product features include:

- Polyester construction for superior corrosion resistance, moisture rejection and electrical insulation.
- Seven color options are available on five different cap types.
- Modular contact blocks use #6 steel plated terminal screws with self lifting captive wire clamps that accommodate #22 through two #12 AWG wires per terminal.
- Operators conveniently mount in a round 22.5mm or 7/8" hole that is directly interchangeable with competitors units and eliminate the labor required for notching.

Unique Product Features

Our revolutionary U-cup seal is infused with a Teflon coating to eliminate cracking when exposed to harsh conditions such as heat, dryness and sunlight. The U-Cup seal rides easily along the stroker and keeps water, oils, dust and other corrosive particles in the air away from the contact blocks. The U-Cup seal also acts like a squeegee and forms a permanent watertight seal that meets or exceeds Type 4/4X.

IT'S EASY TO BUILD YOUR OWN PUSH BUTTON

Simply pick the code number from each of the sections below and combine them to build your part number. See page 2 for more detailed directions.

Maintained Push Buttons (Non-Illuminated)

2-Position Push-Pull

W22PP – ____ ____ – ____ / ____ / ____

I II III IV* V* VI*

Example: To build one of our most popular Push Buttons, the part number would be W22PP + II + III + IV + V + VI or W22PP-MG-10

*NOTE: Contact block configurations are based on circuit designation. If only two contact blocks are selected, they will be assembled in the left and right positions.

I. OPERATOR TYPE/FUNCTION

CODE	DESCRIPTION	LIST
W22PP	Push-Pull Maintained Operator	$7.70

II. CAP TYPE

CODE	DESCRIPTION	LIST
M	Mushroom Cap	—
J	Jumbo Mushroom Cap	$1.30

III. CAP COLOR

CODE	DESCRIPTION
K	Black
B	Blue
G	Green
E	Grey
R	Red
W	White
Y	Yellow

IV. CONTACT BLOCK CONFIGURATION (LEFT SIDE)

CODE	DESCRIPTION	LIST
(Blank)	Operator without Contact Blocks	—
10	1 Normally Open Contact Block	$2.30
01	1 Normally Closed Contact Block	$2.30
E	1 "Early Make" Contact Block	$2.30
D	1 "Delayed Break" Contact Block	$2.30
20	2 Normally Open Contact Blocks	$4.60
02	2 Normally Closed Contact Blocks	$4.60
11	1 Normally Open and 1 Normally Closed Contact Blocks	$4.60

V. CONTACT BLOCK CONFIGURATION (CENTER)

(USE CHART IV FROM ABOVE)

VI. CONTACT BLOCK CONFIGURATION (RIGHT SIDE)

(USE CHART IV FROM ABOVE)

The 2-Position Push-Pull is maintained in both the push and pull positions. The primary application is "push" to "stop" and "pull" to "start".

O = OPEN X = CLOSED

MAINTAINED IN/MAINTAINED OUT

1 CIRCUIT (01)			2 CIRCUIT (11)			2 CIRCUIT (02)		
	OUT	IN		OUT	IN		OUT	IN
NC	X	O	NC	X	O	NC	X	O
			NO	O	X	NC	X	O

DISCOUNT SCHEDULE C

MIX AND MATCH ANY COLOR AND PUSH-PULL MAINTAINED NON-ILLUMINATED CAP


Mushroom Cap (40mm dia.)


Mushroom Cap (40mm dia.)


Mushroom Cap (40mm dia.)

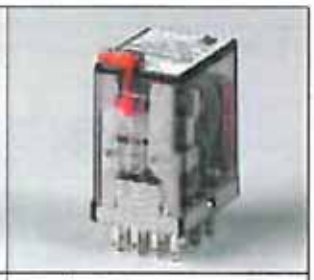
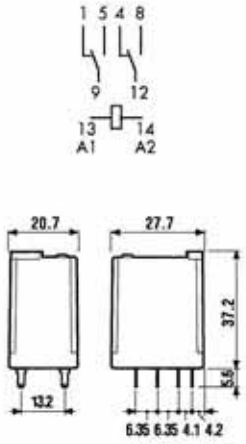
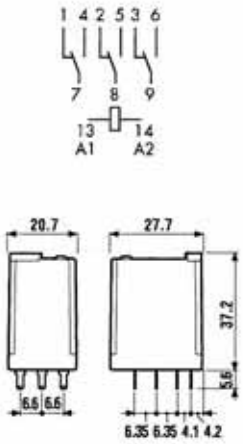
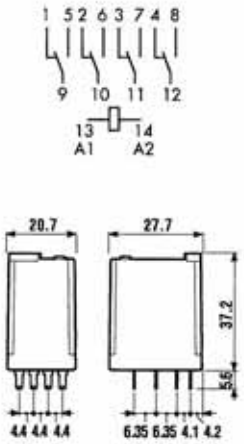

Mushroom Cap (40mm dia.)


Jumbo Mushroom Cap (60mm dia.)


Jumbo Mushroom Cap (60mm dia.)


Jumbo Mushroom Cap (60mm dia.)

- *Plug-in versions*
- *AC or DC coils*
- *Lockable test button and mechanical flag indicator as standard on 2 and 4 CO (DPDT and 4PDT) relays types*
- *Sockets and accessories: see 94, 99 and 86 series*

	55.32	55.33	55.34
			
	- 2 pole, 10 A - Plug-in for use with 94 series sockets	- 3 pole, 10 A - Plug-in for use with 94 series sockets	- 4 pole, 7 A - Plug-in for use with 94 series sockets
			
Contact specifications			
Contact configuration	2 CO (DPDT)	3 CO (3PDT)	4 CO (4PDT)
Rated current/Maximum peak current A	10/20	10/20	7/15
Rated voltage/Maximum switching voltage V AC	250/400	250/400	250/250
Rated load in AC1 VA	2,500	2,500	1,750
Rated load in AC15 (230 V AC) VA	500	500	350
Single phase motor rating (230 V AC) kW	0.37	0.37	0.125
Breaking capacity in DC1: 30/110/220 V A	10/0.25/0.12	10/0.25/0.12	7/0.25/0.12
Minimum switching load mW (V/mA)	300 (5/5)	300 (5/5)	300 (5/5)
Standard contact material	AgNi	AgNi	AgNi
Coil specifications			
Nominal voltage (U_N) V AC (50/60 Hz)	6 - 12- 24 - 48 - 60 - 110 - 120 - 230 - 240		
V DC	6 - 12 - 24 - 48 - 60 - 110 - 125 - 220		
Rated power AC/DC VA (50 Hz)/W	1.5/1	1.5/1	1.5/1
Operating range AC	(0.8...1.1)U_N	(0.8...1.1)U_N	(0.8...1.1)U_N
DC	(0.8...1.1)U_N	(0.8...1.1)U_N	(0.8...1.1)U_N
Holding voltage AC/DC	0.8 U_N/0.5 U_N	0.8 U_N/0.5 U_N	0.8 U_N/0.5 U_N
Must drop-out voltage AC/DC	0.2 U_N/0.1 U_N	0.2 U_N/0.1 U_N	0.2 U_N/0.1 U_N
Technical data			
Mechanical life AC/DC cycles	20 · 10^6/50 · 10^6	20 · 10^6/50 · 10^6	20 · 10^6/50 · 10^6
Electrical life at rated load AC1 cycles	200 · 10^3	200 · 10^3	150 · 10^3
Operate/release time ms	9/3	9/3	9/3
Insulation according to EN 61810-1 ed. 2	3.6 kV/2	3.6 kV/2	2.5 kV/2
Insulation between coil and contacts (1.2/50 µs) kV	3.6	3.6	3.6
Dielectric strength between open contacts V AC	1,000	1,000	1,000
Ambient temperature range °C	–40...+85	–40...+85	–40...+85
Environmental protection	RT I	RT I	RT I
Approvals (according to type):			

ORDERING INFORMATION

Example: a 55 series plug-in relay, 4 CO (4PDT) contacts, coil rated 12 V DC with a lockable test button and mechanical indicator.

5 5	.	3	4	.	9	.	0 1 2	.	A: 0	B: 0	C: 4	D: 0

Series

Type
1 = P.C.B.
3 = Plug-in

No. of poles
2 = 2 pole, 10 A
3 = 3 pole, 10 A
4 = 4 pole, 7 A

Coil version
8 = AC (50/60 Hz)
9 = DC

Coil voltage
see coil specifications

A: Contact material
0 = Standard AgNi
2 = AgCdO
5 = AgNi + Au (5 µm)

B: Contact circuit
0 = CO (nPDT)

C: Options
0 = None
1 = Lockable test button
2 = Mechanical indicator
3 = LED (AC)
4 = Lockable test button + mechanical indicator
5 = Lockable test button + LED (AC)
54 = Lockable test button + LED (AC) + mechanical indicator
6 = Double LED (DC not polarized)
7 = Lockable test button + double LED (DC not polarized)
74 = Lockable test button + double LED (DC not polarized) + mechanical indicator
8 = LED + diode (positive to pin A1/13, DC standard polarity)
9 = Lockable test button + LED + diode (positive to pin A1/13, DC standard polarity)
94 = Lockable test button + LED + diode (positive to pin A1/13, DC standard polarity) + mechanical indicator

D: Special versions
0 = Standard
1 = Wash tight (RT III) for 55.12, 55.13 and 55.14 only
6 = Rear flange mount

55

Only combinations in the same row are possible

Preferred versions

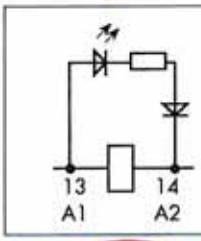
	coil version	A	B	C	D
55.32/34	AC/DC	0	0	4	0
55.12/13/14	AC/DC	0	0	0	0
55.33	AC/DC	0	0	0	0

All versions

	coil version	A	B	C	D
55.32/34	AC/DC	0 - 2 - 5	0	0	0 - 6
	AC	0 - 2 - 5	0	2 - 3 - 4 - 5	0 - 6
	AC	0 - 2 - 5	0	54	/
	DC	0 - 2 - 5	0	2 - 4 - 6 - 7 - 8 - 9	0 - 6
	DC	0 - 2 - 5	0	74 - 94	/
55.33	AC/DC	0 - 2 - 5	0	0	0 - 6
	AC	0 - 2 - 5	0	1 - 3 - 5	0 - 6
	DC	0 - 2 - 5	0	1 - 6 - 7 - 8 - 9	0 - 6
55.12/13/14	AC/DC	0 - 2 - 5	0	0	0 - 1

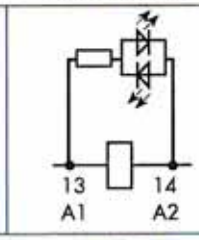
POSSIBLE OPTIONS

AC



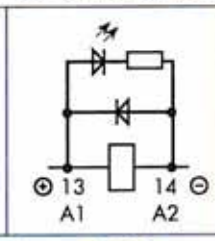
Option = 0030
0050
0054

DC - Not polarized

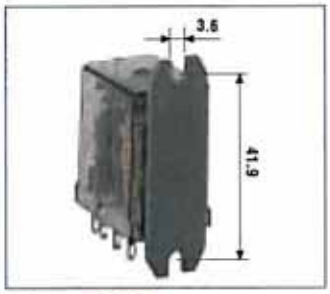


Option = 0060
0070
0074

DC - Standard polarity



Option = 0080
0090
0094



Option = 0006
REAR FLANGE MOUNT

LOCKABLE TEST BUTTON AND MECHANICAL FLAG INDICATOR (0040)

The dual-purpose Finder test button can be used in two ways:

Case 1) The plastic pip (located directly above the test button) remains intact. In this case, when the test button is pushed, the contacts operate. When the test button is released the contacts return to their former state.

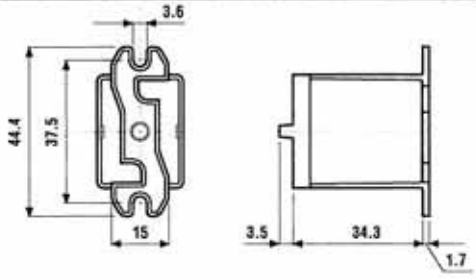
Case 2) The plastic pip is broken-off (using an appropriate cutting tool). In this case, (in addition to the above function), when the test button is pushed and rotated, the contacts are latched in the operating state, and remain so until the test button is rotated back to its former position.

ACCESSORIES

055.05

055.05 with relays

Adaptor with top mount flange for 55.32, 55.33, 55.34	055.05



55

TECHNICAL DATA

INSULATION

Insulation according to EN 61810-1 ed. 2	insulation rated voltage V		400 (2-3 pole)	250 (4 pole)
	rated impulse withstand voltage kV		3.6 (2-3 pole)	2.5 (4 pole)
	pollution degree		2	
	overvoltage category		III	
		2 CO (DPDT)	3 CO (3PDT)	4 CO (4PDT)
Dielectric strength between adjacent contact V AC		2,000	2,000	1,550

CONDUCTED DISTURBANCE IMMUNITY

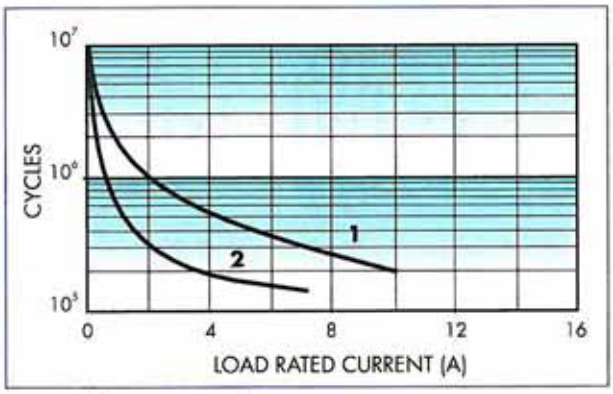
Burst (5...50)ns, 5 kHz, on A1 - A2	EN 61000-4-4	level 4 (4 kV)
Surge (1.2/50 µs) on A1 - A2 (differential mode)	EN 61000-4-5	level 4 (4 kV)

OTHER DATA

Bounce time: NO/NC ms		1/4		
Vibration resistance (10...55)Hz, max. ± 1 mm: NO/NC g/g		6/6		
Power lost to the environment		2 CO (DPDT)	3 CO (3PDT)	4 CO (4PDT)
	without contact current W	1	1	1
	with rated current W	3	4	3
Recommended distance between relays mounted on P.C.B.s mm		≥ 5		

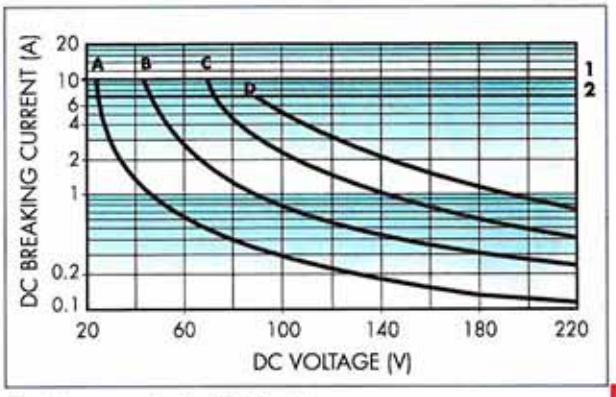
CONTACT SPECIFICATIONS

F 55



Electrical life vs AC1 load.
1 - 2 - 3 CO (DPDT - 3PDT) relay type (10 A)
2 - 4 CO (4PDT) relay type (7 A)

H 55



Breaking capacity for DC1 load.
1 - 2 - 3 CO (DPDT - 3PDT) type
2 - 4 CO (4PDT) type
A - Load applied to 1 contact
B - Load applied to 2 contacts in series
C - Load applied to 3 contacts in series
D - Load applied to 4 contacts in series

- When switching a resistive load (DC1) having voltage and current values under the curve the expected electrical life is ≥ $100 \cdot 10^3$ cycles.
- In case of DC13 loads the connection of a diode in parallel with the load will permit the same electrical life as for a DC1 load.

Note: the release time of load will be increase.

55

COIL SPECIFICATIONS

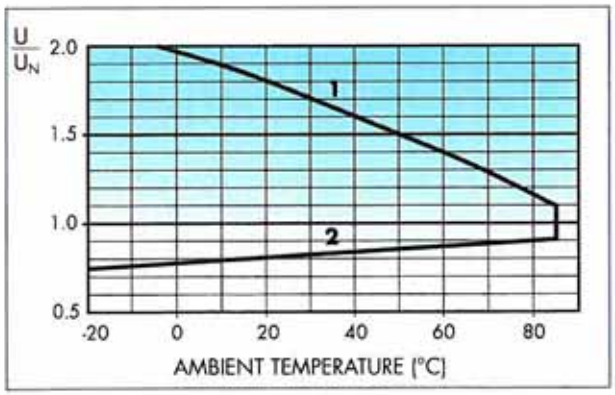
DC VERSION DATA

Nominal voltage U_N	Coil code	Operating range U_{min}	Operating range U_{max}	Resistance R	Rated coil consumption I at U_N
V		V	V	Ω	mA
6	9.006	4.8	6.6	40	150
12	9.012	9.6	13.2	140	86
24	9.024	19.2	26.4	600	40
48	9.048	38.4	52.8	2,400	20
60	9.060	48	66	4,000	15
110	9.110	88	121	12,500	8.8
125	9.125	100	137.5	17,300	7.2
220	9.220	176	242	54,000	4

AC VERSION DATA

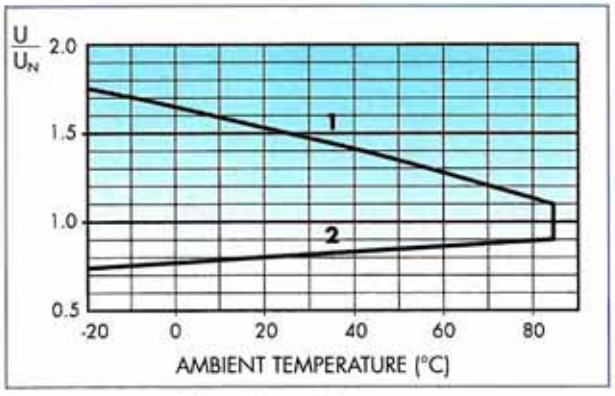
Nominal voltage U_N	Coil code	Operating range U_{min}	Operating range U_{max}	Resistance R	Rated coil consumption I at U_N (50Hz)
V		V	V	Ω	mA
6	8.006	4.8	6.6	12	200
12	8.012	9.6	13.2	50	97
24	8.024	19.2	26.4	190	53
48	8.048	38.4	52.8	770	25
60	8.060	48	66	1,200	21
110	8.110	88	121	4,000	12.5
120	8.120	96	132	4,700	12
230	8.230	184	253	17,000	6
240	8.240	192	264	19,100	5.3

R 55 DC



Operating range (DC type) vs ambient temperature.
1 - Max coil voltage permitted.

R 55 AC



Operating range (AC type) vs ambient temperature.
1 - Max coil voltage permitted.

94.04

Approvals (according to type):

CE B SE GOST cULus

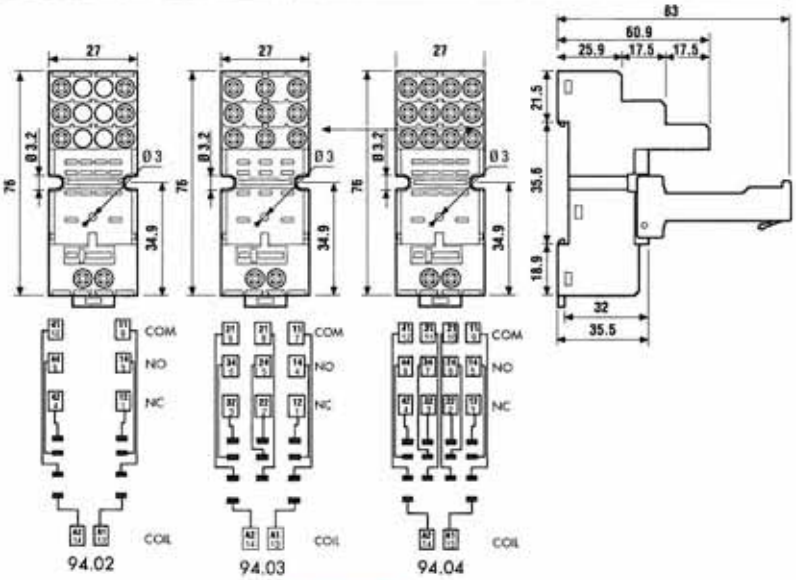
Relay type	55.32		55.33		55.32, 55.34	
Colour	BLUE	BLACK	BLUE	BLACK	BLUE	BLACK
Clamp terminal socket: panel or 35 mm rail (EN 50022) mount retaining clip 094.01 supplied with socket packaging code SPA	94.02	94.02.0	94.03	94.03.0	94.04	94.04.0
Metal retaining clip	094.71					
Plastic retaining and release clip	094.01					
6-way jumper link for 94.02, 94.03 and 94.04 sockets	094.06	094.06.0	094.06	094.06.0	094.06	094.06.0
Identification tag	094.00.4					
Modules (see table below)	99.02					
Timer modules (see table below)	86.10, 86.20					
Sheet of marker tags for retaining and release clip 094.01	060.72					

- Rated values: 10 A - 250 V
- Dielectric strength: ≥ 2 kV AC
- Protection category: IP 20
- Ambient temperature: (-40...+70)°C
- Screw torque: 0.5 Nm
- Wire strip length: 8 mm
- Max wire size:

	solid wire	stranded wire
mm²	1x6 / 2x2.5	1x4 / 2x2.5
AWG	1x10 / 2x14	1x12 / 2x14

094.01

060.72

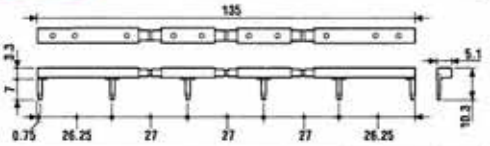


FOR 94.02, 94.03 AND 94.04 SOCKETS:

094.06

6-way jumper link	094.06

- Rated values: 10 A - 250 V



86.10

86 series module timers (see technical data pages 151/155)	BLUE
Mono-function: (12...24)V AC/DC; function AI; (1.5s...60min)	86.10.0.024.0000
Mono-function: (12...24)V AC/DC; function DI; (1.5s...60min)	86.20.0.024.0000

Approvals (according to type): GOST cULus

99.02

Approvals (according to type):

cULus GOST

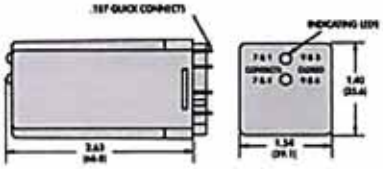
99.02 coil indication and EMC suppression modules (see technical data page 209)		BLUE*
Diode** (+A1, standard polarity)	(6...220)V DC	99.02.3.000.00
Diode (+A2, non standard polarity)	(6...220)V DC	99.02.2.000.00
LED	(6...24)V DC/AC	99.02.0.024.59
LED	(28...60)V DC/AC	99.02.0.060.59
LED	(110...240)V DC/AC	99.02.0.230.59
LED + Diode** (+A1, standard polarity)	(6...24)V DC	99.02.9.024.99
LED + Diode** (+A1, standard polarity)	(28...60)V DC	99.02.9.060.99
LED + Diode** (+A1, standard polarity)	(110...220)V DC	99.02.9.220.99
LED + Diode (+A2, non standard polarity)	(6...24)V DC	99.02.9.024.79
LED + Diode (+A2, non standard polarity)	(28...60)V DC	99.02.9.060.79
LED + Diode (+A2, non standard polarity)	(110...220)V DC	99.02.9.220.79
LED + Varistor	(6...24)V DC/AC	99.02.0.024.98
LED + Varistor	(28...60)V DC/AC	99.02.0.060.98
LED + Varistor	(110...240)V DC/AC	99.02.0.230.98
RC circuit	(6...24)V DC/AC	99.02.0.024.09
RC circuit	(28...60)V DC/AC	99.02.0.060.09
RC circuit	(110...240)V DC/AC	99.02.0.230.09
Residual current by-pass (62 kΩ/1W)	(110...240)V AC	99.02.8.230.07

* Modules in Black housing are available on request.

** For DC supply, apply the positive to terminal A1

Schneider Electric
Phone:
Fax:
Email:

Item # 711XBXCL-120A, 711 Impulse Sequencing Relay / DPDT, 12 Amp Rating



Contact Characteristics

Contact Configuration	
Contact Rating (switching current max)	
Contact Materials	
Maximum Switching Voltage	
Minimum Switching Requirement	
Switching Current at Voltage (Resistive)	

Coil Characteristics

Coil Voltage	
Control	
Coil Resistance	
Control Type	

Operating Range	80 to 110% DC 85 to 110% AC
Average Consumption	1.8 VA 1.8 W
Drop-out Voltage Threshold	10% DC 15% AC

Miscellaneous Characteristics

Pin Orientation	Blade

Performance Characteristics

Operating Time (Response Time)	35 ms
Electrical Life (Resistive)	100000 Operations at Rated Current
Mechanical Life	10000000 Unpowered Operations

Environment

Ambient air temperature around the device	-40 to +55¼ C (Operation) -40¼ to 85¼ C (Storage)
Vibration Resistance (Operational)	3 g-n at 10-55 Hz
Shock Resistance	10 g-n
Degree of Protection	IP 40

Miscellaneous

Weight	110 grams

Product Certifications

Agency Approvals	UR RoHS

Specifications

Dielectric Strength	1500 VAC (rms) Between coil & contact 1500 VAC (rms) Between contacts 500 VAC (rms) Between poles

Print Back

15 AMPS, 300 VOLTS

UL Recognized
File No. E70550

97899

COMPLIES WITH REQUIREMENTS OF

- IEC STANDARDS 947-4-1 AND 947-5-1 LOW VOLTAGE DIRECTIVE
- IEC = INTERNATIONAL ELECTROTECHNICAL COMMISSION
- CE TESTING AND EVALUATION PERFORMED BY THE UNDERWRITERS LABORATORIES AS A THIRD PARTY PARTICIPANT

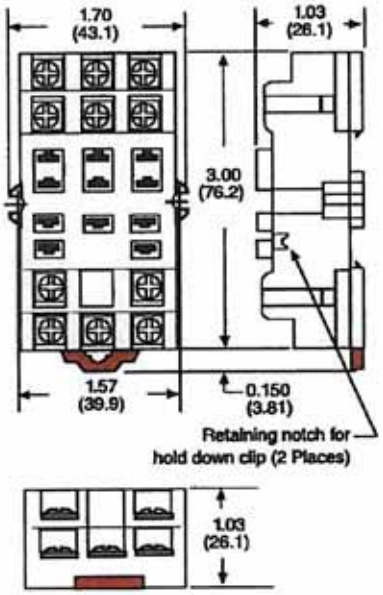
FEATURES	BENEFITS
HEAVY DUTY 1 PIECE TRACK AND CONTACT SYSTEM:	ALLOWS FOR GREATER HEAT DISSIPATION AND LOWER CONTACT RESISTANCE AT THE RELAY TERMINALS.
STANDARD DIN RAIL MOUNTING:	FITS ALL STANDARD 35 MILLIMETER DIN TRACKS.

DESIGNED FOR PANEL OR DIN MOUNT.

MANUFACTURED UNDER ISO 9001

OUTLINE DIMENSIONS

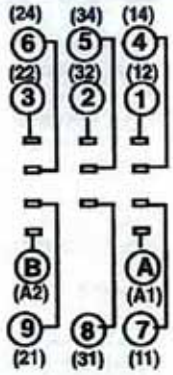
DIMENSIONS SHOWN IN INCHES & (MILLIMETERS).
TOLERANCES: ± 0.010 (± 0.25)
UNLESS OTHERWISE SHOWN



HOLD DOWN CLIPS ARE ORDERED SEPARATELY

WIRING DIAGRAM

(TOP VIEW)



ALTERNATE NEMA OR IEC ( ) NUMBERS VIEWED FROM PIN SIDE

GENERAL SPECIFICATIONS (@ 25°C)

	UNITS	
NUMBER OF TERMINALS		11
ELECTRICAL RATING		
Nominal Voltage Rating:	Volts	300
Nominal Current Rating:	Amps	15
DIELECTRIC STRENGTH		
Output to Adjacent output Terminals:	V rms	2000
Output to Input Terminals:	V rms	2000
Terminals to Rail Chassis:	V rms	2000
CONSTRUCTION		
Protection Category (Finger Safe):	IEC	N / A
Internal Metal Tracks:		Copper Alloy, Zinc Plated
Screws Terminals:		Steel, Zinc Plated
Screw Style and Size:	mm	Combination Head, M3.5 x 0.06 x 5.08
Screw Terminal Torque Maximum:	Lb-in / Nm	9 / 1.01
TEMPERATURE		
Operating, Lower:	°C	-40
Operating, Upper:	°C	+80
MISCELLANEOUS		
Chassis Mount Screw Torque:	Lb-in / Nm	8 - 10 / 0.90 - 1.13
Flammability Rating:		94V-0
Wire Size:	AWG/mm2	20-12 / 0.5 - 3.0
Body Color:		Light gray
DIN Locking Clip Color:		Red
Weight:	grams	51

Mating Relays
788, A283
See section 1
388TDR, TDRSOXB
See section 4
Mating Hold Down Clips
(788) 16-1352
(A283) 16-1340
(388TDR) 16-1239 Long Body
(TDRSOXB) 16-1239

STANDARD PART NUMBER	DESCRIPTION
70 - 463 - 1	11 PIN SOCKET, DIN/PANEL MOUNT, WITH SCREW TERMINALS & CLAMPING PLATES.

PHONE: (843) 393-5778 FAX: (843) 393-4123 EMAIL: info@magnecraft.com

PHOENIX CONTACT

Extract from the online catalog

UT 4

Order No.: 3044102

http://eshop.phoenixcontact.de/phoenix/treeViewClick.do?UID=3044102

Universal terminal block with screw connection, cross section: 0,14 - 4 mm², AWG: 26 - 10, width: 6.2 mm, color: Gray

Commercial data	
EAN	4017918960391
Pack	50 Pcs.
Customs tariff	85369010
Weight/Piece	0.009424 KG
Catalog page information	Page 27 (CL-2007)

Product notes

WEEE/RoHS-compliant since: 01/01/2003

http://www.download.phoenixcontact.com
Please note that the data given here has been taken from the online catalog. For comprehensive information and data, please refer to the user documentation. The General Terms and Conditions of Use apply to Internet downloads.

Technical data

General

Number of levels	1
Number of connections	2
Color	gray

Insulating material	PA
Inflammability class acc. to UL 94	V0

Dimensions

Width	6.2 mm
Length	47.7 mm
Height NS 35/7,5	47.5 mm
Height NS 35/15	55 mm

Technical data

Maximum load current	41 A (with 6 mm^2 conductor cross section)
Rated surge voltage	8 kV
Pollution degree	3
Surge voltage category	III
Insulating material group	I
Connection in acc. with standard	IEC 60947-7-1
Nominal current I_N	32 A (with 4 mm^2 conductor cross section)
Nominal voltage U_N	1000 V
Open side panel	ja

Connection data

Conductor cross section solid min.	0.14 mm^2
Conductor cross section solid max.	6 mm^2
Conductor cross section stranded min.	0.14 mm^2
Conductor cross section stranded max.	6 mm^2
Conductor cross section AWG/kcmil min.	26
Conductor cross section AWG/kcmil max	10
Conductor cross section stranded, with ferrule without plastic sleeve min.	0.25 mm^2
Conductor cross section stranded, with ferrule without plastic sleeve max.	4 mm^2
Conductor cross section stranded, with ferrule with plastic sleeve min.	0.25 mm^2
Conductor cross section stranded, with ferrule with plastic sleeve max.	4 mm^2
2 conductors with same cross section, solid min.	0.14 mm^2
2 conductors with same cross section, solid max.	1.5 mm^2

2 conductors with same cross section, stranded min.	0.14 mm^2
2 conductors with same cross section, stranded max.	1.5 mm^2
2 conductors with same cross section, stranded, TWIN ferrules with plastic sleeve, min.	0.5 mm^2
2 conductors with same cross section, stranded, TWIN ferrules with plastic sleeve, max.	2.5 mm^2
2 conductors with same cross section, stranded, ferrules without plastic sleeve, min.	0.25 mm^2
2 conductors with same cross section, stranded, ferrules without plastic sleeve, max.	1.5 mm^2
Type of connection	Screw connection
Stripping length	9 mm
Internal cylindrical gage	A4
Screw thread	M 3
Tightening torque, min	0.6 Nm
Tightening torque max	0.8 Nm

Certificates / Approvals

CSA

Nominal voltage U_N	600 V
Nominal current I_N	30 A
AWG/kcmil	26-10

CUL

Nominal voltage U_N	600 V
Nominal current I_N	30 A
AWG/kcmil	26-10

UL

Nominal voltage U_N	600 V
Nominal current I_N	30 A
AWG/kcmil	26-10
Certification	CB, CSA, CUL, DNV, GL, LR, UL, VDE-PZI

requested approbations

Certification Ex:	IECEx, KEMA-EX

Accessories

Item	Designation	Description
Assembly		
3047167	ATP-UT	Partition plate, for visual and electrical separation of terminal groups, width: 2 mm, color: gray
3047028	D-UT 2,5/10	Cover, for terminal block UT and UT...-PE, width 2.2 mm, color: Gray
0801762	NS 35/ 7,5 CU UNPERF 2000MM	DIN rail, material: Copper, unperforated, height 7.5 mm, width 35 mm, length: 2 m
1207640	NS 35/ 7,5 PERF 755MM	NS 35 DIN rail, height 7.5 mm, length 755 mm
1207653	NS 35/ 7,5 PERF 955MM	NS35 DIN rail, height 7.5 mm, length 955 mm
1207666	NS 35/ 7,5 PERF 1155MM	NS 35 DIN rail, height 7.5 mm, length 1155 mm
0801733	NS 35/ 7,5 PERF 2000MM	DIN rail, material: Steel, perforated, height 7.5 mm, width 35 mm, length: 2 m
0801681	NS 35/ 7,5 UNPERF 2000MM	DIN rail, material: Steel, unperforated, height 7.5 mm, width 35 mm, length: 2 m
1201756	NS 35/15 AL UNPERF 2000MM	DIN rail, deep-drawn, high profile, unperforated, 1.5 mm thick, material: Aluminum, height 15 mm, width 35 mm, length 2 m
1201895	NS 35/15 CU UNPERF 2000MM	DIN rail, material: Copper, unperforated, 1.5 mm thick, height 15 mm, width 35 mm, length: 2 m
1207679	NS 35/15 PERF 755MM	NS 35 DIN rail, perforated, height 15 mm, length 755 mm
1207682	NS 35/15 PERF 955MM	NS 35 DIN rail, perforated, height 15 mm, length 955 mm
1207695	NS 35/15 PERF 1155MM	NS 35 DIN rail, perforated, height 15 mm, length 1155 mm
1201730	NS 35/15 PERF 2000MM	DIN rail, material: Steel, perforated, height 15 mm, width 35 mm, length: 2 m
1201714	NS 35/15 UNPERF 2000MM	DIN rail, material: Steel, unperforated, height 15 mm, width 35 mm, length: 2 m
1201798	NS 35/15-2,3 UNPERF 2000MM	DIN rail, material: Steel, unperforated, 2.3 mm thick, height 15 mm, width 35 mm, length: 2 m
Bridges		
3030336	FBS 2-6	Plug-in bridge for cross-connections in the terminal center, 2-pos., color: Red
3030242	FBS 3-6	Plug-in bridge for cross-connections in the terminal center, 3-pos., color: Red
3030255	FBS 4-6	Plug-in bridge for cross-connections in the terminal center, 4-pos., color: Red

3030349	FBS 5-6	Plug-in bridge for cross-connections in the terminal center, 5-pos., color: Red
3030271	FBS 10-6	Plug-in bridge for cross-connections in the terminal center, 10-pos., color: Red
3030365	FBS 20-6	Plug-in bridge for cross-connections in the terminal center, 20-pos., color: Red
3032224	FBS 50-6	Plug-in bridge for cross-connections in the terminal center, 50-pos., color: Red

General

3022276	CLIPFIX 35-5	Snap-on end bracket, for NS 35/7.5 or NS 35/15 DIN rail, can be fitted with Zack strip ZB 5 and ZBF 5, terminal strip marker KLM 2 and KLM, parking facility for FBS...5, FBS...6, KSS 5, KSS 6, width: 5,15 mm, color: gray

Marking

0811228	X-PEN 0,35	Marker pen without ink cartridge, for manual labeling of markers, labeling extremely wipe-proof, line thickness 0.35 mm
1051016	ZB 6,LGS:FORTL.ZAHLEN	Zack strip, 10-section, printed horizontally: with the numbers, 1-10, 11-20 etc. up to 991-1000, color: white
5060935	ZB 6/WH-100:UNBEDRUCKT	Zack strip, unprinted: For individual labeling with M-PEN, ZB-T or CMS system, large batch, sufficient for labeling 1000 terminal blocks, for a terminal width of 6.2 mm, color: White
1050499	ZB 6:SO/CMS	Zack strip, 10-section, divisible, special printing, marking according to customer requirements

Plug/Adapter

0201689	MPS-IH BU	Insulating sleeve (blue), for MPS metal part to be ordered separately (0201744)
0201676	MPS-IH RD	Insulating sleeve (red), for MPS metal part to be ordered separately (0201744)
0201663	MPS-IH WH	Insulating sleeve (white), for MPS metal part to be ordered separately (0201744)
0201744	MPS-MT	Test plug, consisting of: Metal part for 2.3 mm diameter socket hole
3030925	PAI-4	Test adapter, for 4 mm diameter test plug PS and safety test plug, makes contact in the bridge shaft
3030996	PS-6	Modular test plug, for individual assembly of test plug strips, for UT, ST, DT and QT terminal blocks, can be labeled with ZBF 6, color: Red

Tools

1205053	SZS 0,6X3,5	Screwdriver, bladed, matches all screw terminal blocks up to 4.0 mm² connection cross section, blade: 0.6 x 3.5 mm, without VDE approval

Address

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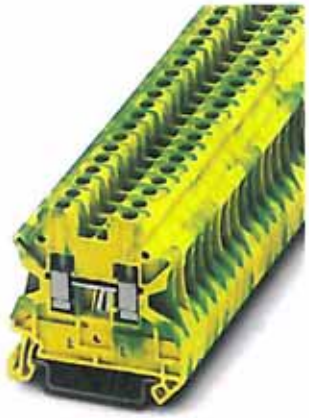
586 Fulling Mill Road
Middletown, PA 17057,USA
Phone (800) 888-7388
Fax (717) 944-1625
http://www.phoenixcon.com

PHOENIX CONTACT

Extract from the online catalog

UT 4-PE

Order No.: 3044128



http://eshop.phoenixcontact.de/phoenix/treeViewClick.do?UID=3044128

Universal terminal block with screw connection, cross section: 0.14 - 4 mm², AWG: 26 - 10, width: 6.2 mm, color: Green-yellow

Commercial data	
EAN	4017918960407
Pack	50 Pcs.
Customs tariff	85369010
Weight/Piece	0.01325 KG
Catalog page information	Page 33 (CL-2007)

Product notes

WEEE/RoHS-compliant since: 01/01/2003

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Technical data

General	
Number of levels	1
Number of connections	2
Color	green-yellow

Insulating material	PA
Inflammability class acc. to UL 94	V0

Dimensions

Width	6.2 mm
Length	47.7 mm
Height NS 35/7,5	47.5 mm
Height NS 35/15	55 mm

Technical data

Rated surge voltage	8 kV
Pollution degree	3
Surge voltage category	III
Insulating material group	I
Connection in acc. with standard	IEC 60947-7-2
Open side panel	ja

Connection data

Conductor cross section solid min.	0.14 mm^2
Conductor cross section solid max.	6 mm^2
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Conductor cross section stranded max.	6 mm^2
Conductor cross section AWG/kcmil min.	26
Conductor cross section AWG/kcmil max	10
Conductor cross section stranded, with ferrule without plastic sleeve min.	0.25 mm^2
Conductor cross section stranded, with ferrule without plastic sleeve max.	4 mm^2
Conductor cross section stranded, with ferrule with plastic sleeve min.	0.25 mm^2
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2 conductors with same cross section, solid max.	1.5 mm^2
2 conductors with same cross section, stranded min.	0.14 mm^2
2 conductors with same cross section, stranded max.	1.5 mm^2

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
Type of connection	Screw connection
Stripping length	9 mm
Internal cylindrical gage	A4
Screw thread	M 3
Tightening torque, min	0.6 Nm
Tightening torque max	0.8 Nm

Certificates / Approvals

CSA

AWG/kcmil	26-10

CUL

AWG/kcmil	26-10

UL

AWG/kcmil	26-10
Certification	CB, CSA, CUL, DNV, GL, LR, UL, VDE-PZI

requested approbations

Certification Ex:	IECEx, KEMA-EX

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3030349	FBS 5-6	Plug-in bridge for cross-connections in the terminal center, 5-pos., color: Red
3030271	FBS 10-6	Plug-in bridge for cross-connections in the terminal center, 10-pos., color: Red
3030365	FBS 20-6	Plug-in bridge for cross-connections in the terminal center, 20-pos., color: Red
3032224	FBS 50-6	Plug-in bridge for cross-connections in the terminal center, 50-pos., color: Red

General

3022276	CLIPFIX 35-5	Snap-on end bracket, for NS 35/7.5 or NS 35/15 DIN rail, can be fitted with Zack strip ZB 5 and ZBF 5, terminal strip marker KLM 2 and KLM, parking facility for FBS...5, FBS...6, KSS 5, KSS 6, width: 5,15 mm, color: gray

Marking

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1051016	ZB 6,LGS:FORTL.ZAHLEN	Zack strip, 10-section, printed horizontally: with the numbers, 1-10, 11-20 etc. up to 991-1000, color: white
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3030996	PS-6	Modular test plug, for individual assembly of test plug strips, for UT, ST, DT and QT terminal blocks, can be labeled with ZBF 6, color: Red

Tools

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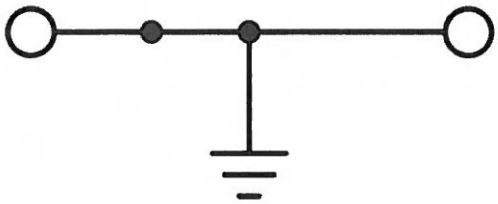
Drawings

Circuit diagram



Address

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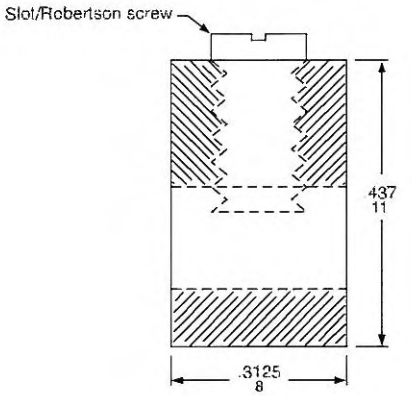
http://www.phoenixcon.com



Cross Section of Size 1 Ground Bar

TECHNICAL INFORMATION

Grounding Bar Kits

All PK equipment grounding kits are supplied with mounting screws, necessary installation instructions, and an "Equipment Grounding Terminal" self-adhesive label.

Catalog Number	Total Qty.	Terminals: Quantity Each Size See "Wire Range Table" below.						Approximate Overall Length		Distance Between Mounting Holes		Mounting
		I	II	III	IV	V	VI	in.	mm	in.	mm	
PK0GTA2 ◆	2						2	1.75	44	One hole	One hole	Top
PK0GTA6 ■	6					6		4.61	117	1.69	43	Top
PK3GTA1 ✚	3	3						1.38	35	One hole	One hole	Top
PK4GTA ✚	4	4						1.63	41	One hole	One hole	Top
PK5GTA ▼	5	5						2.25	57	1.25	32	Top
PK7GTA ✚	7	7						2.88	73	1.25	32	Top or side
PK9GTA1 ✚	9	9						3.25	83	One hole	One hole	Top
PK9GTA ✚	9	9						3.78	96	3.13	80	Top
PK12GTA ✚	12	12						4.70	119	3.13	80	Top
PK15GTA ✚	15	15						5.63	143	3.13	80	Top
PK15GTAL ★	16	15	1					8.13	207	3.13	80	Top
PK15GTA6 ❖	21	15			6			5.88	149	▲	▲	Top
PK18GTA ✚	18	18						6.56	167	3.13	80	Top
PK18GTAL ★	19	18	1					8.81	224	3.13	80	Top
PK23GTA ✚	23	23						8.11	206	3.13	80	Top
PK23GTAL ★	24	23	1					9.44	240	3.13	80	Top
PK27GTA ● ✚	27 or 26	27 26		1				9.36	238	3.13	80	Top

● PK27GTA includes one main grounding lug that mounts with two terminal screws and requires three terminals for mounting.
▲ 3.13 in. (80 mm) on small terminals; 5.25 in. (133 mm) on large terminals.
◆ Mounting screw 40205-065-01 (one required).
✚ Mounting screw 21594-14220 (two required).
★ Mounting screw 21594-14302 (two required).
■ Mounting screw 21922-18360 (two required).
▼ Mounting screw 21594-14241 (two required).
❖ Mounting screws 21594-14241(two required) and 21594-17121(two required).

Wire Range Table

Size	Cu (AWG)	Al (AWG)
I	(1) #14–#4 or (2) #14 or #12	(1) #12–#4 or (2) #12 or #10
II	(1) #1–4/0	(1) #1–4/0
III	(1) #6–2/0	(1) #6–2/0
IV	(1) #6–3/0	(1) #6–3/0
V	(1) #14–1/0	(1) #14–1/0
VI	(1) #10–2/0	(1) #6–2/0

How to Order Ty-Duct®

Ordering the Ty-Duct® products you need is as easy as 1, 2, 3!

After selecting the appropriate Ty-Duct solutions for your application, make sure you complete the following checklist.

For Ty-Duct Wiring Duct and Covers:

1. Specify color
2. Indicate if you want the duct without mounting holes
3. Indicate if you want an adhesive-backed duct (not available in Wide Slot Duct — Halogen Free)

[_] = space for color identifier:

G	= Gray
W	= White
B	= Black
I	= Intrinsic Blue

2 *To order duct without mounting holes, add suffix NM to catalog number.* ***Example:*** *TY75X1WPG6NM is a .75" x 1" wide slot gray duct with no mounting holes.*

3 *To order Adhesive-Backed Duct, add suffix A to Catalog Number.*

Example: *TY75x15WPB6A is a .75" x 1.5" wide slot black duct with adhesive backing.*

Shelf life for adhesive is 1 year.

Nominal Width x Nominal Height | *Standard Carton Quantity*

CAT. NO.	DESCRIPTION	SIZE (W x H) IN.	SIZE (W x H) MM	COVER CAT. NO.	DUCT STD. CTN. QTY.	COVER STD. CTN. QTY.	LENGTH (FT.)
TY75X1WP[G]6NM	.75 x 1 Wide Slot Duct	0.94 x 1.09	23.9 x 27.7		120		
TY75X15WP[B]6A	.75 x 1.5 Wide Slot Duct	0.94 x 1.56	23.9 x 39.6	TY75CP[_]6	120	120	6
TY75X2WP[I]6	.75 x 2 Wide Slot Duct	0.94 x 2.07	23.9 x 52.6		120		

SP *= Solid*
WP *= Wide Slot*
NP *= Narrow Slot*
RP *= Round Hole*

1 *Catalog Number must be completed by adding suffix* ***G*** *for Gray,* ***W*** *for White,* ***I*** *for Intrinsic Blue,* ***B*** *for Black.* ***Example:*** *TY75x2WPI6 is a .75" x 2" wide slot intrinsic blue duct. Cover color must be specified also.*

Standard lengths are 6 feet.

For Ty-Duct Dividers:

Catalog Number must be completed by adding suffix SP for Solid or WP for Wide Slot. ***Example:*** *TY2DSPG6 is a 2" high solid wall gray divider.*

CAT. NO.	DESCRIPTION	LENGTH (FT.)	STD. CTN. QTY
TY2D[SP][G]6	2" High Wall Divider	6	120

Catalog Number must be completed by adding suffix G for Gray, W for White, I for Intrinsic Blue, B for Black. ***Example:*** *TY2DSPG6 is a 2" high solid wall gray divider.*

For Ty-Duct Corner & Joining Strips:

Corner Strip sample shown below. Joining Strips are ordered the same way.

CAT. NO.	DESCRIPTION	LENGTH (FT.)	STD. CTN. QTY
TYCS[G]6	Corner Strip	6	120
TYJS[G]6	Joining Strip	6	120

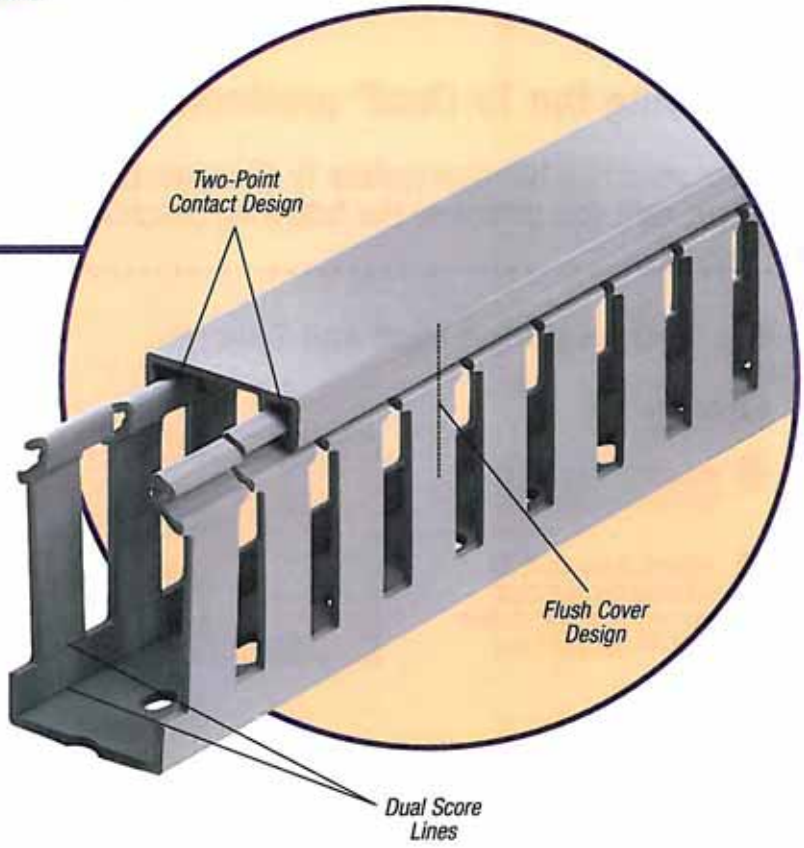
Catalog Number must be completed by adding suffix G for Gray, W for White, I for Intrinsic Blue, B for Black. ***Example:*** *TYCSG6 is a gray corner strip.*

Wide Slot Wiring Duct

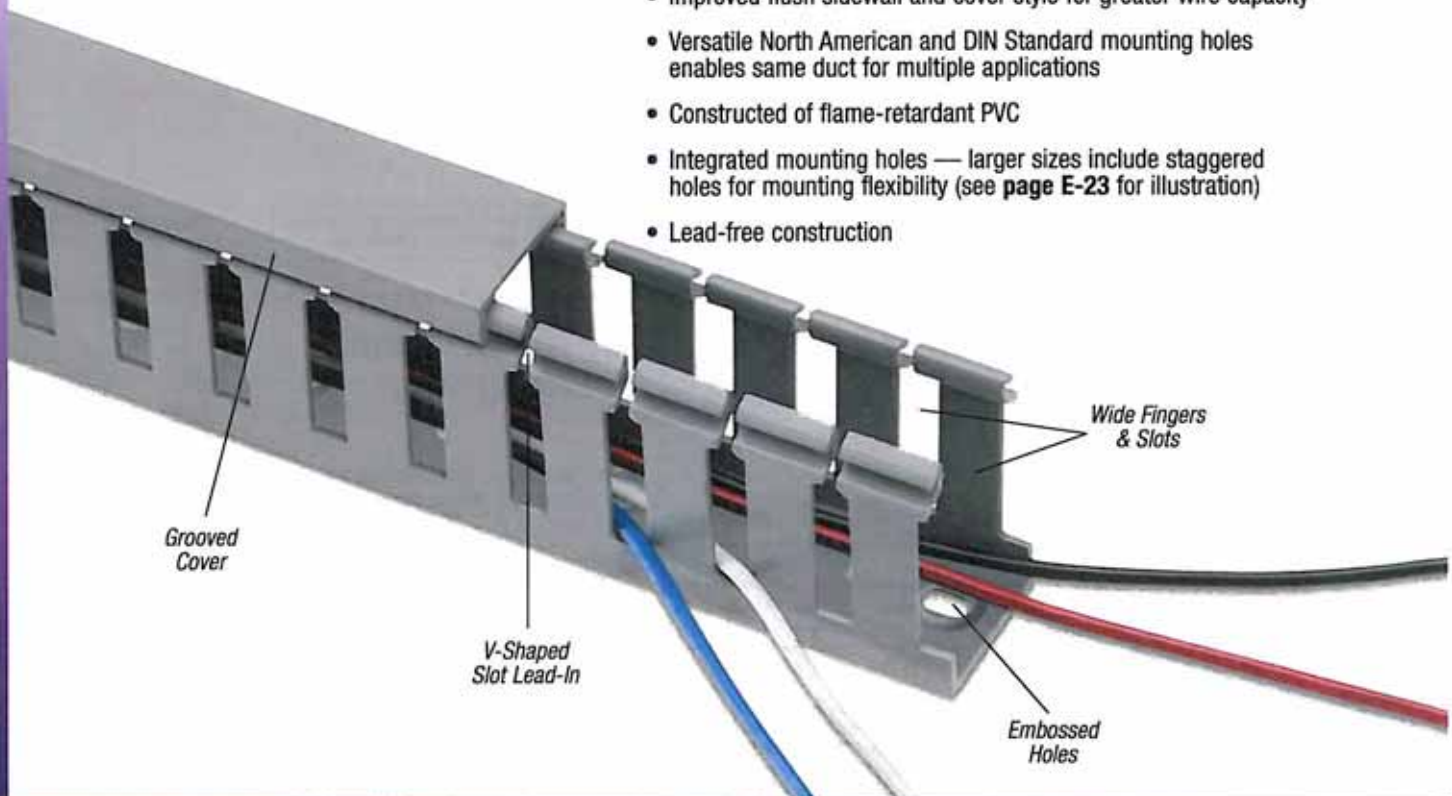
Greater sidewall rigidity with increased versatility!

Wide Slot Wiring Duct — PVC

- Wide fingers and slots increase rigidity and enable insertion of bundles
- Non-slip cover does not slide easily and resists vibration
- Rounded edges keep hands and wires free of abrasion
- V-shaped slot lead-in enables easier and faster wire installation
- Dual score lines are designed to yield clean breakoffs at the base of the slot and the duct
- Restricted slot design makes sure that wires are held with or without the cover inserted
- Flush cover attaches flush with sidewall for finished look



- Improved flush sidewall and cover style for greater wire capacity
- Versatile North American and DIN Standard mounting holes enables same duct for multiple applications
- Constructed of flame-retardant PVC
- Integrated mounting holes — larger sizes include staggered holes for mounting flexibility (see **page E-23** for illustration)
- Lead-free construction



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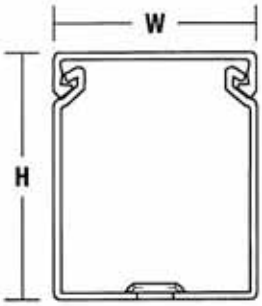
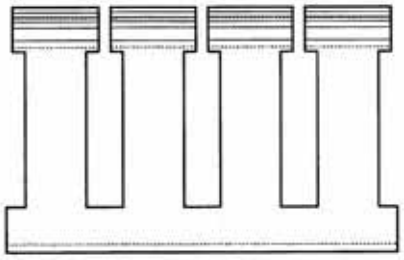
United States
Tel: 901.252.8000
800.816.7809
Fax: 901.252.1354
Canada
Tel: 450.347.5318
Fax: 450.347.1976
Technical Services
Tel: 888.862.3289

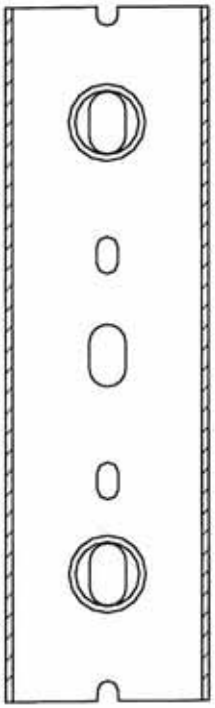
Wide Slot Wiring Duct



Front View w/Cover


Side View

For a complete listing of Wide Slot dimensional details see **page E-23.**


Bottom View

CAT. NO.	DESCRIPTION	SIZE (W x H) IN.	SIZE (W x H) MM	COVER CAT. NO.	DUCT STD. CTN. QTY	COVER STD. CTN. QTY	LENGTH (FT.)
TY75X1WP[_]6	.75 x 1 Wide Slot Duct	0.94 x 1.14	23.9 x 27.7		120		
TY75X15WP[_]6	.75 x 1.5 Wide Slot Duct	0.94 x 1.60	23.9 x 39.6	TY75CP[_]6	120	120	6
TY75X2WP[_]6	.75 x 2 Wide Slot Duct	0.94 x 2.10	23.9 x 52.6		120		
TY1X1WP[_]6	1 x 1 Wide Slot Duct	1.25 x 1.14	31.8 x 27.7		120		
TY1X15WP[_]6	1 x 1.5 Wide Slot Duct	1.25 x 1.60	31.8 x 39.9		120		
TY1X2WP[_]6	1 x 2 Wide Slot Duct	1.25 x 2.10	31.8 x 52.8	TY1CP[_]6	120	120	6
TY1X3WP[_]6	1 x 3 Wide Slot Duct	1.25 x 3.05	31.8 x 77.7		120		
TY1X4WP[_]6	1 x 4 Wide Slot Duct	1.25 x 4.37	31.8 x 111.3		60		
TY15X1WP[_]6	1.5 x 1 Wide Slot Duct	1.75 x 1.14	44.5 x 27.7		120		
TY15X15WP[_]6	1.5 x 1.5 Wide Slot Duct	1.75 x 1.60	44.5 x 39.9		120		
TY15X2WP[_]6	1.5 x 2 Wide SlotDuct	1.75 x 2.10	44.5 x 52.8	TY15CP[_]6	120	120	6
TY15X3WP[_]6	1.5 x 3 Wide Slot Duct	1.75 x 3.05	44.5 x 77.7		120		
TY15X4WP[_]6	1.5 x 4 Wide Slot Duct	1.75 x 4.37	44.5 x 111.3		60		
TY2X1WP[_]6	2 x 1 Wide Slot Duct	2.25 x 1.24	57.2 x 28.4		120		
TY2X15WP[_]6	2 x 1.5 Wide Slot Duct	2.25 x 1.70	57.2 x 40.4		120		
TY2X2WP[_]6	2 x 2 Wide Slot Duct	2.25 x 2.19	57.2 x 53.3	TY2CP[_]6	120	120	6
TY2X3WP[_]6	2 x 3 Wide Slot Duct	2.25 x 3.14	57.2 x 78.2		60		
TY2X4WP[_]6	2 x 4 Wide Slot Duct	2.25 x 4.46	57.2 x 111.8		60		
TY2X5WP[_]6	2 x 5 Wide Slot Duct	2.25 x 5.15	57.2 x 129.3		60		
TY25X2WP[_]6	2.5 x 2 Wide Slot Duct	2.75 x 2.19	69.9 x 53.6		120		
TY25X3WP[_]6	2.5 x 3 Wide Slot Duct	2.75 x 3.14	69.9 x 78.2	TY25CP[_]6	60	120	6
TY25X4WP[_]6	2.5 x 4 Wide Slot Duct	2.75 x 4.46	69.9 x 111.8		60		
TY3X1WP[_]6	3 x 1 Wide SlotDuct	3.25 x 1.24	82.6 x 29.0		120		
TY3X2WP[_]6	3 x 2 Wide Slot Duct	3.25 x 2.19	82.6 x 54.9		60		
TY3X3WP[_]6	3 x 3 Wide Slot Duct	3.25 x 3.14	82.6 x 79.8	TY3CP[_]6	60	120	6
TY3X4WP[_]6	3 x 4 Wide Slot Duct	3.25 x 4.46	82.6 x 113.5		60		
TY3X5WP[_]6	3 x 5 Wide Slot Duct	3.25 x 5.15	82.6 x 130.6		60		
TY4X15WP[_]6	4 x 1.5 Wide Slot Duct	4.25 x 1.70	108.0 x 42.4		60		
TY4X2WP[_]6	4 x 2 Wide Slot Duct	4.25 x 2.19	108.0 x 55.1		60		
TY4X3WP[_]6	4 x 3 Wide Slot Duct	4.25 x 3.14	108.0 x 80.0	TY4CP[_]6	60	120	6
TY4X4WP[_]6	4 x 4 Wide Slot Duct	4.25 x 4.46	108.0 x 113.8		30		
TY4X5WP[_]6	4 x 5 Wide Slot Duct	4.25 x 5.15	108.0 x 130.8		30		
TY6X4WP[_]6	6 x 4 Wide Slot Duct	6.25 x 4.46	158.8 x 114.0	TY6CP[_]6	30	60	6

[_] = space for color identifier:

- G = Gray
- W = White
- B = Black
- I = Intrinsic Blue

- *Standard lengths are 6 feet.*

+Catalog Number must be completed by adding suffix G for Gray, W for White, I for Intrinsic Blue, B for Black.
Example: *TY75X1WPG6 is a .75" x 1" wide slot gray duct.*

To order duct without mounting holes, add suffix NM to catalog number.
Example: *TY75X1WPG6NM is a .75" x 1" wide slot gray duct with no mounting holes.*

To order Adhesive-Backed Duct, add suffix A to Catalog Number.
Example: *TY75X1WPG6A is a .75" x 1" wide slot gray duct with adhesive backing. Shelf life for adhesive is 1 year.*

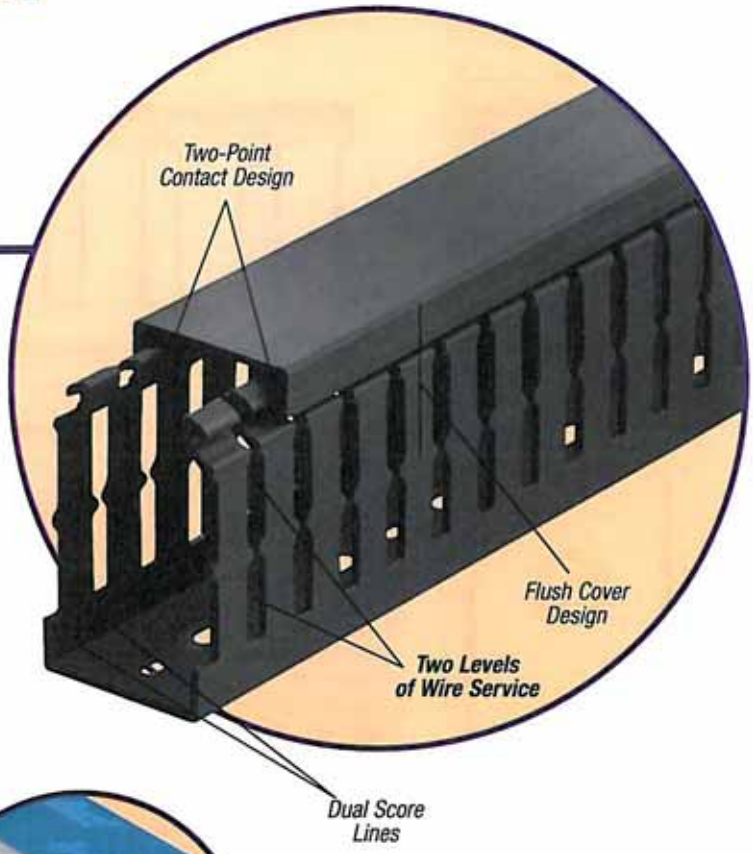
PVC vinyl duct is UL Recognized, CSA Certified and CE Compliant.

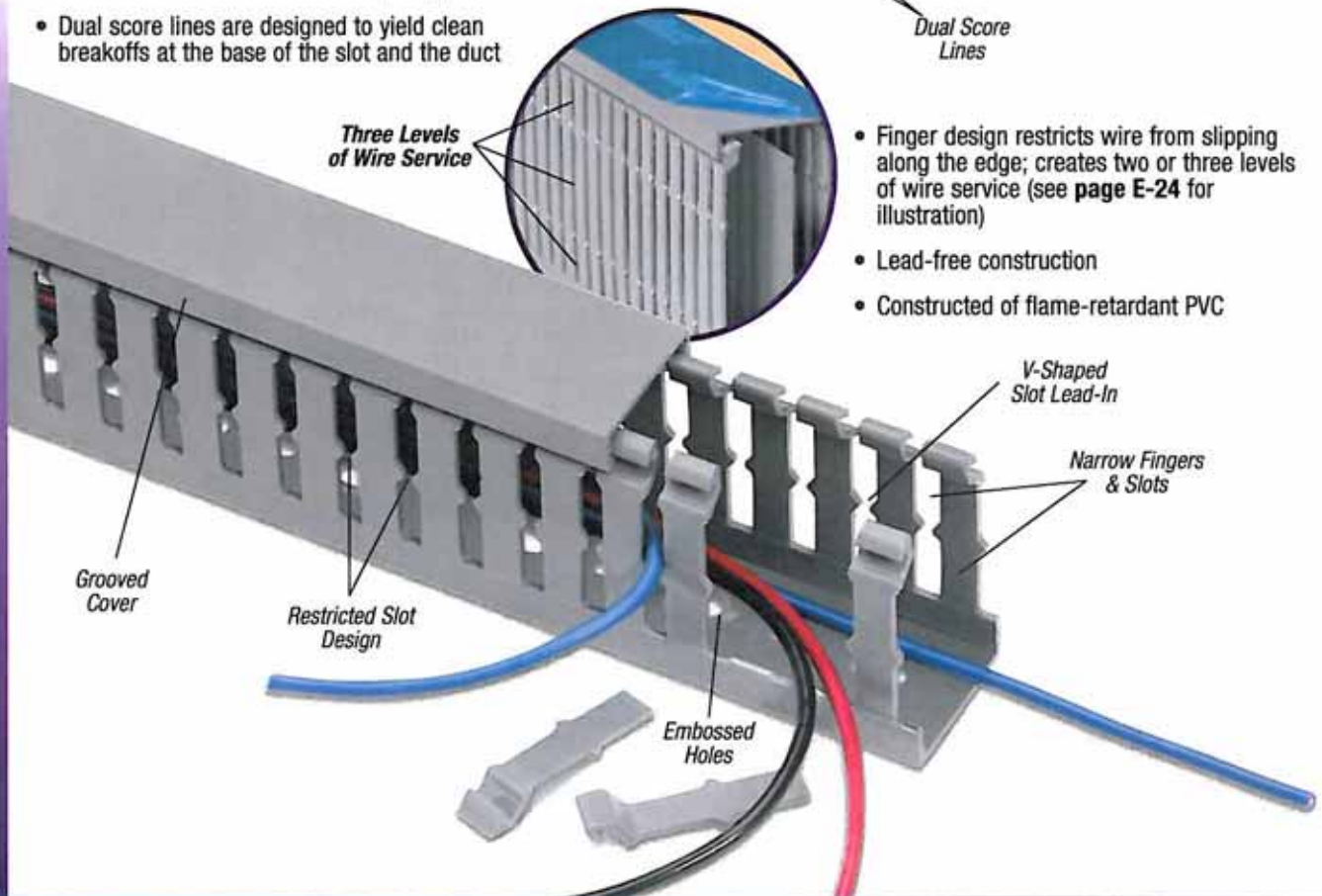
Narrow Slot Wiring Duct

Designed to fit the spacing of high-density terminal blocks!

Narrow Slot Wiring Duct

- Smaller, higher number of fingers for more concise harnessing
- Non-slip cover does not slide easily and resists vibration
- Rounded edges keep hands and wires free of abrasion
- V-shaped slot lead-in enables easier and faster wire installation
- Restricted slot design makes sure that wires are held with or without the cover inserted
- Flush cover attaches flush with sidewall for finished look
- Versatile North American and DIN Standard mounting holes enable same duct for multiple applications
- Dual score lines are designed to yield clean breakoffs at the base of the slot and the duct





- Finger design restricts wire from slipping along the edge; creates two or three levels of wire service (see **page E-24** for illustration)
- Lead-free construction
- Constructed of flame-retardant PVC

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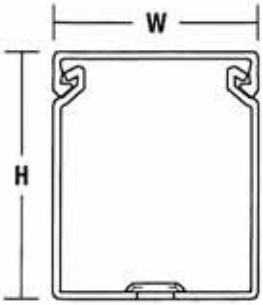
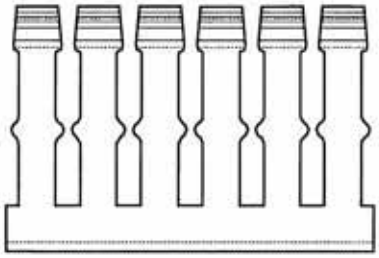
Narrow Slot Wiring Duct

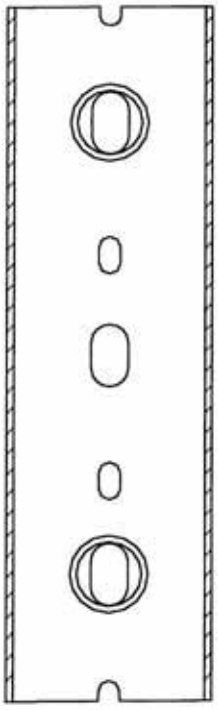


Front View w/Cover



Side View

For a complete listing of Narrow Slot dimensional details see page E-24.



Bottom View

CAT. NO.	DESCRIPTION	SIZE (W x H) IN.	SIZE (W x H) MM	COVER CAT. NO.	DUCT STD. CTN. QTY	COVER STD. CTN. QTY	LENGTH (FT.)
TY75X15NP[_]6	.75 x 1.5 Narrow Slot Duct	0.94 x 1.60	23.9 x 39.6	TY75CP[_]6	120	120	6
TY1X1NP[_]6	1 x 1 Narrow Slot Duct	1.25 x 1.14	31.8 x 27.7		120		
TY1X15NP[_]6	1 x 1.5 Narrow Slot Duct	1.25 x 1.60	31.8 x 39.9		120		
TY1X2NP[_]6	1 x 2 Narrow Slot Duct	1.25 x 2.10	31.8 x 52.8	TY1CP[_]6	120	120	6
TY1X3NP[_]6	1 x 3 Narrow Slot Duct	1.25 x 3.05	31.8 x 77.7		120		
TY1X4NP[_]6	1 x 4 Narrow Slot Duct	1.25 x 4.37	31.8 x 111.3		60		
TY15X1NP[_]6	1.5 x 1 Narrow Slot Duct	1.75 x 1.14	44.5 x 27.7		120		
TY15X15NP[_]6	1.5 x 1.5 Narrow Slot Duct	1.75 x 1.60	44.5 x 39.9		120		
TY15X2NP[_]6	1.5 x 2 Narrow Slot Duct	1.75 x 2.10	44.5 x 52.8	TY15CP[_]6	120	120	6
TY15X3NP[_]6	1.5 x 3 Narrow Slot Duct	1.75 x 3.05	44.5 x 77.7		120		
TY15X4NP[_]6	1.5 x 4 Narrow Slot Duct	1.75 x 4.37	44.5 x 111.3		60		
TY2X1NP[_]6	2 x 1 Narrow Slot Duct	2.25 x 1.24	57.2 x 28.4		120		
TY2X15NP[_]6	2 x 1.5 Narrow Slot Duct	2.25 x 1.70	57.2 x 40.4		120		
TY2X2NP[_]6	2 x 2 Narrow Slot Duct	2.25 x 2.19	57.2 x 53.3	TY2CP[_]6	120	120	6
TY2X3NP[_]6	2 x 3 Narrow Slot Duct	2.25 x 3.14	57.2 x 78.2		60		
TY2X4NP[_]6	2 x 4 Narrow Slot Duct	2.25 x 4.46	57.2 x 111.8		60		
TY2X5NP[_]6	2 x 5 Narrow Slot Duct	2.25 x 5.15	57.2 x 129.3		60		
TY25X2NP[_]6	2.5 x 2 Narrow Slot Duct	2.75 x 2.19	69.9 x 53.6		120		
TY25X3NP[_]6	2.5 x 3 Narrow Slot Duct	2.75 x 3.14	69.9 x 78.2	TY25CP[_]6	60	120	6
TY25X4NP[_]6	2.5 x 4 Narrow Slot Duct	2.75 x 4.46	69.9 x 111.8		60		
TY3X1NP[_]6	3 x 1 Narrow Slot Duct	3.25 x 1.24	82.6 x 29.0		120		
TY3X2NP[_]6	3 x 2 Narrow Slot Duct	3.25 x 2.19	82.6 x 54.9		60		
TY3X3NP[_]6	3 x 3 Narrow Slot Duct	3.25 x 3.14	82.6 x 79.8	TY3CP[_]6	60	120	6
TY3X4NP[_]5	3 x 4 Narrow Slot Duct	3.25 x 4.46	82.6 x 113.5		60		
TY3X5NP[_]6	3 x 5 Narrow Slot Duct	3.25 x 5.15	82.6 x 130.6		60		
TY4X2NP[_]6	4 x 2 Narrow Slot Duct	4.25 x 2.19	108.0 x 55.1		60		
TY4X3NP[_]6	4 x 3 Narrow Slot Duct	4.25 x 3.14	108.0 x 80.0	TY4CP[_]6	60	120	6
TY4X4NP[_]6	4 x 4 Narrow Slot Duct	4.25 x 4.46	108.0 x 113.8		30		
TY4X5NP[_]6	4 x 5 Narrow Slot Duct	4.25 x 5.15	108.0 x 130.8		30		

[_] = space for color identifier:

- G = Gray
- W = White
- B = Black
- I = Intrinsic Blue

- *Standard lengths are 6 feet.*
- *+ Catalog Number must be completed by adding suffix G for Gray, W for White, I for Intrinsic Blue, B for Black.*
  Example: *TY75X15NPB6 is a .75" x 1.5" narrow slot black duct.*

  To order duct without mounting holes, add suffix NM to catalog number.
  Example: *TY75X15NPB6NM is a .75" x 1.5" narrow slot black duct with no mounting holes.*

  To order Adhesive-Backed Duct, add suffix A to Catalog Number.
  Example: *TY75X15NPB6A is a .75" x 1.5" narrow slot black duct with adhesive backing. Shelf life for adhesive is 1 year.*

PVC vinyl duct is UL Recognized, CSA Certified and CE Compliant.

Ty-Duct® meets all of the prominent agency approvals and standards.

Agency Approvals:

Thomas & Betts Ty-Duct wiring duct is UL recognized for all requirements set forth in UL standard 1565 "Positioning Device."

The Ty-Duct wiring duct meets all applicable requirements of the Canadian Standard Association as described in CSA C22.2 No. 18.5.

All Ty-Duct wiring duct components comply with the European Directives for CE (Conformite European) Marking.

All materials used in the making of the Ty-Duct wiring duct comply with the European Directives 2002/95/EC (RoHS), 2002/96/EC (WEEE), and 2003/11/EC.

Standards:

NFPA-79-2002

Thomas & Betts Ty-Duct wiring duct is compliant with the National Fire Protection Agency NFPA-79-2002. All materials used in the manufacturing of the Ty-Duct components are selected from flame-retardant material and comply with IEC 60332-1. The testing is required in order to comply with NFPA-79-2002, Section 13.3.1.

UL 508/UL 508A

As required in UL508/UL508A a factory-installed conductor shall be separated from a conductor used in a different circuit when the conductors are not insulated for the maximum voltage of either circuit. The Ty-Duct wiring duct with a divider wall creates the required separation to meet this requirement.

DIN 43 659

This European standard specifies dimensions for slotted trunkings installed in electrical switchgear assemblies. The standard defines the following dimensions:

- The mounting hole pattern
- The mounting hole slot dimensions
- The mounting hole pitch and location
- The minimum overall product length

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Certificate of Limited Warranty

Reciprocating Compressors

All component parts on this compressor installed by the manufacturer are warranted to be free of defects, workmanship and material for a period of one year. Transportation charges are the responsibility of the purchaser. This warranty extends to the original purchaser of the compressor only. The purchaser must use Compressed Air Systems synthetic reciprocating compressor oil in the compressor for the duration of the compressor warranty.

There are NO express warranties except other than those contained in this limited warranty statement.

Covered in the one year period of the warranty are defective parts due to defects in the original part only.

The compressor warranty is void in the case of abuse, lack of proper service, in correct application, in correct installation, and neglect.

Standard compressor warranty covers defective parts and labor for the one year period.

Industrial electric stationary compressors may be repaired on site as long as the compressor is not located further than 50 miles from the service center. The purchaser is responsible for any additional travel expense past 50 miles from the service center.

Gas/Diesel engine driven, Single stage stationary, and Contractor series compressors **must be repaired at the closest service center to the compressor.** The purchaser is responsible for any travel expense if they do not wish to bring the compressor to the service center.

ALL "SPECIALTY COMPRESSOR" WARRANTY SERVICE MUST BE PERFORMED AT THE CLOSEST SERVICE CENTER TO THE COMPRESSOR.

Specialty compressor - any compressor package with options other than those that apply to the standard model number in the catalog.

ALWAYS CONTACT MANUFACTURER TECH SUPPORT FOR FASTEST SOLUTION BEFORE WARRANTY SERVICE IS PERFORMED.

WARRANTY LABOR FOR THE FIRST YEAR IS ONLY COVERED FOR WORK PERFORMED MONDAY-FRIDAY 8AM-5PM EXCLUDING ALL MAJOR US HOLIDAYS.

OPTIONAL 6 YEAR INDUSTRIAL RECIPROCATING PUMP ONLY WARRANTY

To be applicable for this option purchaser must purchase the Full Year reciprocating compressor maintenance kit at the same time as the compressor. A subsequent kit must be purchased every 12 months from the date of the original purchase for a total of 6 kits during the warranty of the period of the pump. The purchaser must use only Compressed Air Systems synthetic reciprocating compressor oil in the compressor for the duration of the compressor warranty.

The warranty covers the Industrial reciprocating pump for a period of 6 years parts replacement only for any part with a defect from the manufacturer, excluding the compressor valves which carry the same 1 year standard warranty. The warranty does not cover standard wear and tear on parts, abuse, neglect, improper service, misapplication, and improper installation. The purchaser is responsible for any freight/shipping expense incurred.

Important

Always contact manufacturer tech support for fastest solution before warranty service is performed.

Before warranty service can be performed on a unit the servicing company must contact the manufacture to get a warranty procedure verification number. Without a warranty verification number work may not be covered by the manufacturer under warranty. A warranty verification number does not guarantee a part or piece of the product is warrantable but guarantees it will be reviewed for warranty credit.

All warranty replacement parts must be Industrial Gold OEM part unless authorization is given from Industrial Gold factory representative.

5-2018

WARNING: Always wear proper protective eye ware, hearing protection and safety clothing when working around the compressor package. No loose or baggy clothing should be worn around compressor package at any time.

WARNING: On Electric motor powered air compressors make sure electrical system is up to National Electric Code (NEC) prior to installing compressor system. Failure to install a compressor with a proper NEC electrical system can cause personal injury, compressor package damage and void compressor package warranty

NOTICE: To ensure full compressor tank warranty all tank mounted compressor packages must be mounted on factory approved vibration isolation pads. A compressor should NEVER be installed while still on or in its original packaging. Failure to properly install the compressor system with approved vibration isolation pads will result in the compressor tank warranty being void.

WARNING: Compressed Air Systems compressors can operate at pressures from 0-250psi depending on the compressor package design and build specifications. Always verify that the system the compressor is installed into can handle the maximum operational pressure the compressor. NEVER install a compressor in a system that can not handle the compressors maximum operating pressure.

WARNING: Compressed air is extremely dangerous when not properly used or installed. Always make sure a trained compressed air professional has looked over the air system prior to use. Improper installation or use of compressed air can cause bodily injury or death. NEVER pressurize an object that was not designed to be pressurized. Pressurizing objects not properly engineered for the maximum operating pressure of the compressor system can cause bodily injury or death.

Additional Information

For compressor pump information see pump specific manual.

For installation instructions see Install Guide.

For compressor package wiring diagram contact manufacturer.

For compressor parts breakdown see website (compressed-air-systems.com) of contact compressor manufacturer.

On electric driven compressors always follow NEC (National Electric Code) on any local applicable code that exceeds NEC guidelines.

On gas/diesel engine driven packages follow engine manufacturer guide for proper placement and installation of engine driven equipment.

Quality Air Compressor at a Great Price.

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