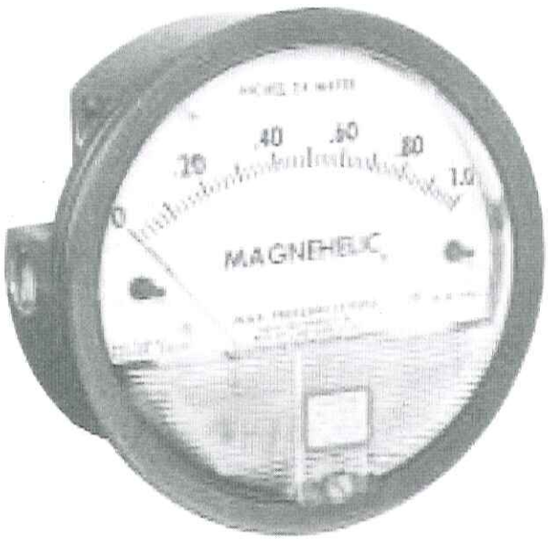
BULLETIN NO. A-27

Magnehelic® Differential Pressure Gage

OPERATING INSTRUCTIONS



SPECIFICATIONS

Dimensions: 4-3/4" dia. x 2-3/16" deep.

Weight: 1 lb. 2 oz.

Finished: Baked dark gray enamel.

Connections: 1/8" NPT high and low pressure taps, duplicated, one pair side and one pair back.

Accuracy: Plus or minus 2% of full scale, at 70°F. (Model 2000-0, 3%; 2000-00, 4%).

Pressure Rating: 15 PSI (0.35 bar)

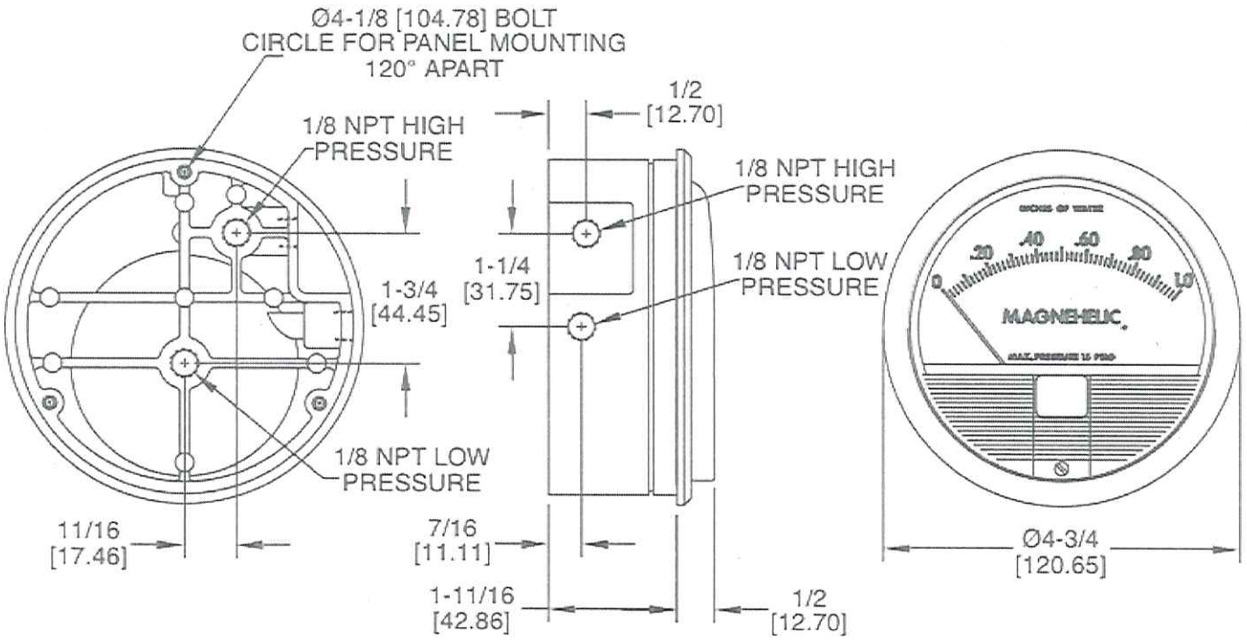
Ambient Temperature Range: 20° to 140°F (-7 to 60°C).

Standard gage accessories include two 1/8" NPT plugs for duplicate pressure taps, two 1/8" NPT pipe thread to rubber tubing adapters, and three flush mounting adapters with screws.

Caution: For use with air or compatible gases only.

For repeated over-ranging or high cycle rates, contact factory.

Not for use with Hydrogen gas. Dangerous reactions will occur.



DWYER INSTRUMENTS, INC.
P.O. BOX 373 • MICHIGAN CITY, INDIANA 46361 U.S.A.

Phone: 219/879-8000
Fax: 219/872-9057
Lit-by-Fax: 888/891-4963

www.dwyer-inst.com
e-mail: info@dwyer-inst.com

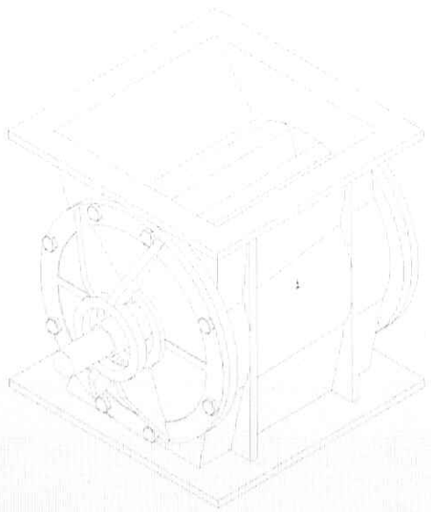
tyco valves & controls

Pneumatic Valve Positioner MCAL

System Installation and Operation Manual

www.tyco-stac.com
E-mail: info@tycovalves.com

Carolina Conveying



ROTARY AIRLOCKS

- **DROP THRU**
- **BLOW THRU**
- **SIDE ENTRY**

Operation & Maintenance Manual

CCI Job: _____
Customer: _____
PO#: _____

Carolina Conveying Inc., 162 Great Oak Drive, Canton NC 28716.
☎ (828) 235-1005 (828) 235-1006 sales@carolinaconveying.com

Boston Gear®

ORC Series

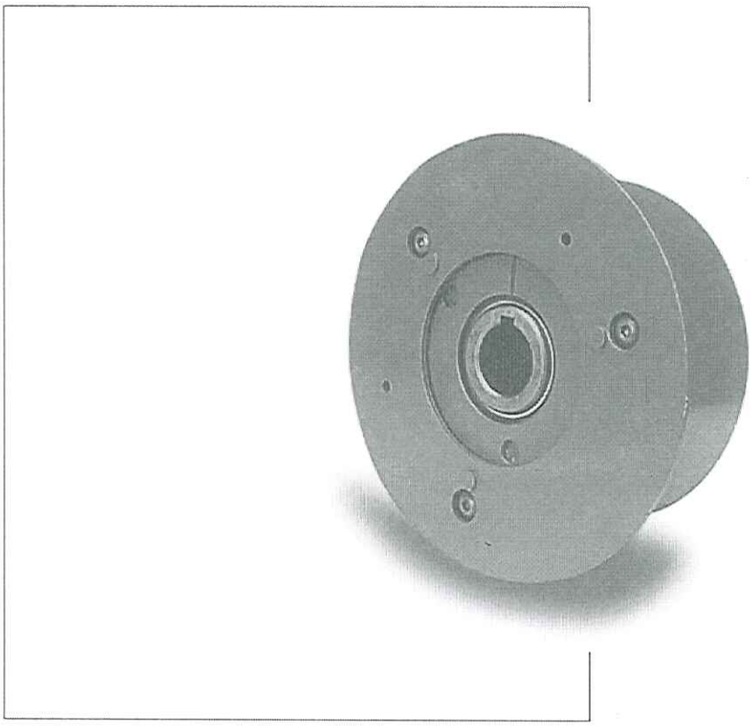
Trig-O-Matic™

Overload Release Clutches

Installation and Maintenance Instructions

Doc. No.

ORC Series
Model S



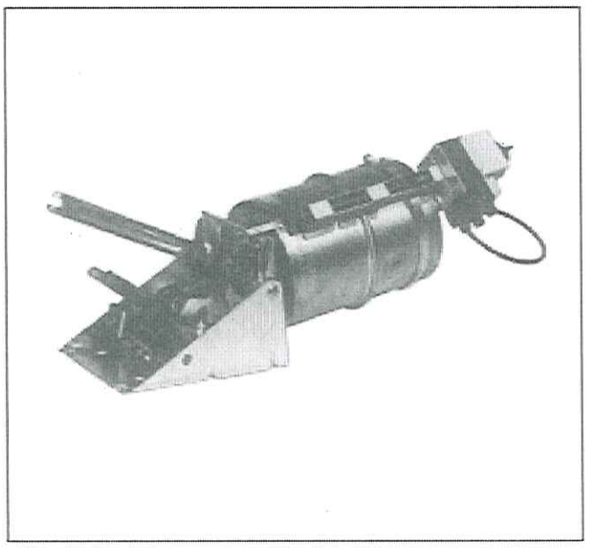
Boston Gear

www.bostongear.com

Honeywell

MP918A and B Pneumatic Damper Actuators

SPECIFICATION DATA



FEATURES

- Rolling Diaphragm operated
- Low friction shaft bearing
- Close tolerance on operating range and stroke
- Versatile mounting and connecting hardware
- Models available for use with UL classified leakage rated (smoke) dampers
- Cost efficient mounting to Honeywell dampers
- Nonoverlapping spring ranges for sequencing
- Reliable—long life

GENERAL

The MP918A and B Damper Actuators position damper blades, controlling the airflow through a particular portion of an HVAC system. The MP918A is the same as the MP918B with a positive positioner.

Copyright © 1996 Honeywell Inc. • All Rights Reserved

77-3080-1

Honeywell

UDC2500
Universal Digital Controller
Product Manual

51-52-25-127

August 2006

Industrial Measurement and Control

Form #20032 1-95

BALDOR ELECTRIC COMPANY
P. O. BOX 2400 • FORT SMITH, ARKANSAS U.S.A. 72902 • (501) 646-4711 • FAX (501) 648-5792

REDUCER INSTALLATION, MAINTENANCE AND LUBRICATION

INSTALLATION

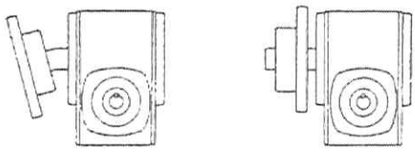
Careful adherence to the following installation suggestions will help you get maximum service and life from your Baldor Reducer.

Baldor Reducer shipments contain oil. Fill the reducer to the proper level with the supplied or recommended lubricant. (See the lubrication information section on this page for specific recommendations.)

ALIGNMENT – When installing Baldor Reducers, care should be taken to align input and output shafts vertically and horizontally with connecting shafts. A flat and even mounting surface will help prevent uneven base hole bolt pressures. Flexible couplings will help compensate for minor variations in shaft alignment. C-Flanged reducers with hollow worm bore require attention to be sure that the key has maximum contact in the keyslots of both the input worm bore and the motor shaft. When mounting the motor to the reducer the key should be inserted in the keyslot of the worm bore not in the keyslot of the motor shaft.

Bolts and Lockwashers for fastening the motor to the reducer are supplied with all Baldor C-Flanged Reducers and should be tightened securely and evenly to help avoid misalignment.

When mounting a sprocket, gear, or sheave etc. on a reducer shaft, mount the working face as close to the reducer housing as possible. The gear or sprocket hub should be nearer the end of the shaft as shown in the illustration. Be careful not to damage the reducer oil seal when mounting the sprocket, gear, or sheave.



INCORRECT CORRECT

Installing in this manner reduces the load on the shaft and increases bearing life.

To reduce unnecessary load and obtain maximum reducer and component life, driving and driven sprockets or sheaves should be properly aligned with their mates and all shafts parallel. Gears should be mounted on shafts at the proper center to center distance.

MAINTENANCE

No routine maintenance other than that recommended in the lubrication section is required for Baldor Reducers. Occasionally oil seals will need replacing and the new seal should be protected from being cut by sharp edges or scratches on the shaft by wrapping the shaft with shim stock or heavy paper during seal installation.

LUBRICATION

Your Baldor Reducer will last longer if the following lubrication schedule and suggestions are followed.

Use a lubricant designed for worm gear drives. Use the #8 Compound lubricant supplied by Baldor with your reducer or any lubricant conforming to the specifications in the AGMA chart below or ask your lubrication supplier for a worm gear lubricant recommendation.

Enclosed Worm Gear Drives

Ambient Temp.	Lubricant AGMA No.	Viscosity Range SUS @ 210°F
15° F to 60°F	7 Compound	125 - 150
50°F to 125°F	8 Compound	150 - 190

FILL your reducer to the proper level by removing the oil level pipe plug and pouring lube in the vent/fill pipe plug hole until it starts to flow out the level hole. Stop pouring and replace the oil level pipe plug and the vent/fill plug.

See pages 3 and 4 for proper vent/fill plug location.

During the initial break-in period, your reducer may run at a higher temperature. After the worm and gear "wear in" the temperature will return to the normal operating range.

After the initial 250 hours of operation, drain the reducer and fill with fresh lubricant. Always drain while the reducer is still warm.

Drain and refill with fresh lubricant every 2500 hours or six months; whichever comes first. More frequent changes are suggested if the lubricant becomes dirty or contaminated due to environment.

Synthetic lubricants can, in some cases, last longer than Petroleum based lubricants and require less frequent changes. Check with your synthetic lubricant supplier for recommendations.

VENT PLUGS supplied in attached bag prevent a build up of internal pressure in a continuously operating reducer. An installation that runs for approximately 15 minutes per hour or less may not require venting.

FILLING DOUBLE REDUCTION REDUCERS

Double reduction reducers have a common oil level. When filling, place the reducer in the correct operating/mounting position, and fill to the required level. Because oil flow is restricted by passage through a bearing, it is advisable to wait 15 minutes for the oil to settle to its level before checking and replacing vent and level plugs. Two vent plugs are supplied although only one is needed. Use the proper vent plug for the venting location for your mounting position as indicated on the drawing on the following pages.

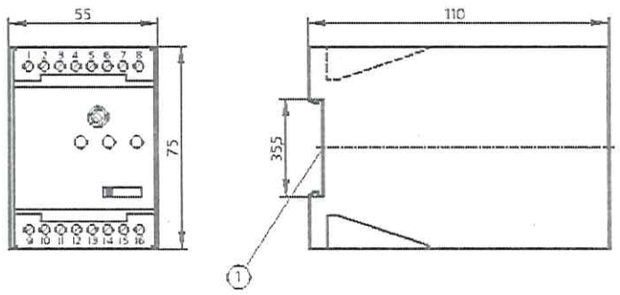
ecomat200 ifm electronic

Evaluation systems, power supplies

DA0116

Standstill monitor A300
Housing for DIN rail mounting

relay and transistor output

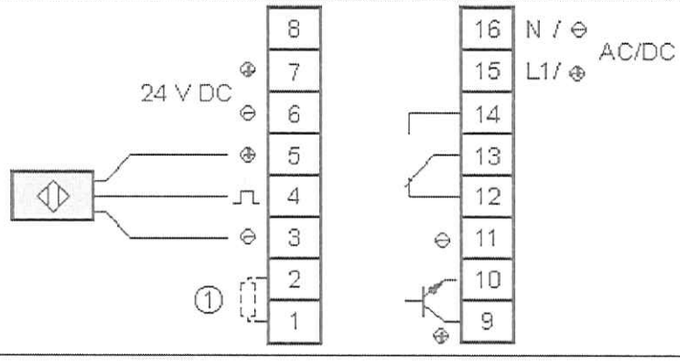


CE cULus LISTED

1: mounting on DIN rail

Application	Evaluation of pulse sequences with regard to underspeed or missing pulse
Output	1 relay (1 changeover contact); transistor output (pnp / 24 V DC; ± 20 % / 200 mA)
Setting range [펄스/min.]	5...25 / 20...100
Nominal voltage [V]	110...240 AC/DC (50...60 Hz) / 27 DC (typ. 24 DC)
Voltage tolerance [%]	-20...+10
Contact rating	6 A (250 V AC); B300, R300
Power consumption [VA]	4
Sensor supply [V]	24 DC (max. 30mA)
Input frequency (max.) [pulses/min]	15000 (250 Hz)
Hysteresis [% / Sr]	5 *)
Repeatability [% / Sr]	3
Start-up delay [s]	15 **)
Switching function	F1/F2, with slide switch
Adjustment of the switch point	fine adjustment within the ranges with potentiometer
Operating temperature [°C]	0...50
Protection housing / terminals	IP 40 / IP 20
Housing material	plastics
Function display	
Switching status LED	green (lights when the output relay is energised)
Power LED	green
Input pulses LED	yellow
Connection	16 terminals...2.5 mm² (AWG 14)
Wiring	

1: remote start-up delay



Remarks

*) fixed

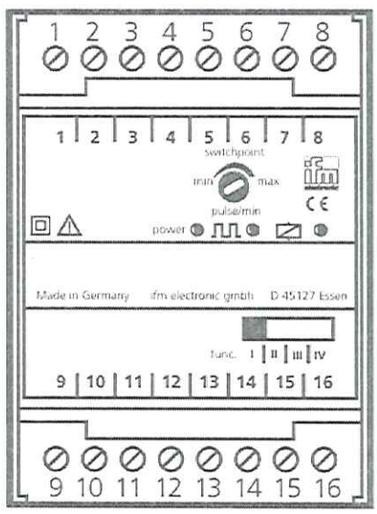
CE

ifm electronic

Bedienungsanleitung
Operating instructions
Notice pour utilisateurs

ecomat200

Stillstandswächter
Standstill monitor
Contrôle d'arrêt
A 300



DEUTSCH
ENGLISH
FRANÇAIS

Sachnr. 7390337/00 03/2002

efector100

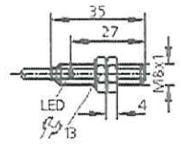
ifm electronic

Inductive sensors

IE5072

IEB3001-BPOG
Metal thread M8 x 1
Cable

Sensing range 1mm [f]
flush mountable

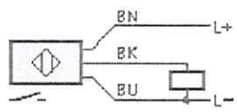


CE

Electrical design	DC PNP
Output	normally open
Operating voltage [V]	10...36 DC
Current rating [mA]	200
Short-circuit protection	no
Reverse polarity protection	no
overload protection	no
Voltage drop [V]	< 1
Current consumption [mA]	< 15 (24 V)
Real sensing range [mm]	1 ± 10 %
Operating distance [mm]	0...0.8
Switch-point drift [% / Sr]	-10...10
Hysteresis [% / Sr]	1...15
Switching frequency [Hz]	750
Correction factors	mild steel = 1 / stainless steel approx. 0.7 / brass approx. 0.4 / Al approx. 0.3 / Cu approx. 0.2
Operating temperature [°C]	-25...80
Protection	IP 67
EMC	EN 60947-5-2; EN 55011 class B
Housing material	brass Optalloy-plated; active face: PBT
Function display Switching status LED	yellow
Connection	PVC cable / 2 m; 3 x 0.14 mm²

Wiring

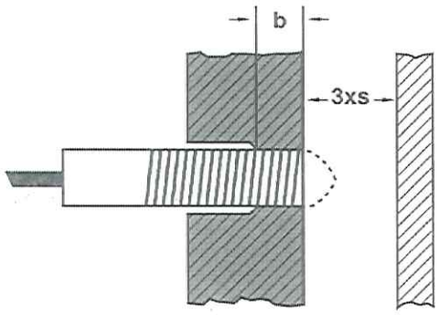
Core colors
BN brown
BU blue
BK black



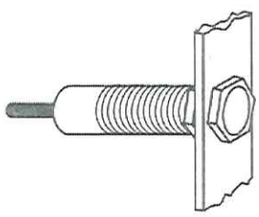
Accessories (included)	2 lock nuts

Mounting Instructions
Flush mountable tubular switches

Flush mountable switches can be mounted so that the active face is flush with a metal surface. Any metal in front of the switch should be kept at a distance of three times the nominal sensing range.

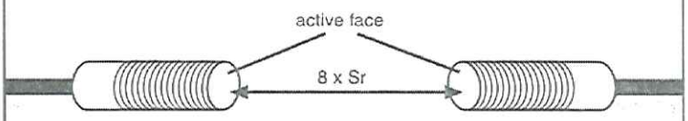


s = nominal sensing range
b = maximum thread length
M8 - 8mm, M12 - 8mm
M18 - 8mm, M 30 - 16mm



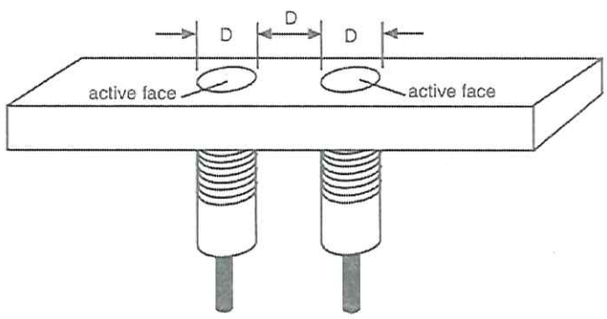
Two flat nuts are provided to hold the installed switch in place.

When mounting tubular switches opposite each other, the spacing distance shown here should be maintained.



Sr = nominal sensing range

When mounting tubular switches next to each other, the spacing distance shown here should be maintained.



D = Switch Diameter

Electrical

DO NOT operate an incandescent light bulb as a load. The current inrush when the bulb is cold can cause a current overload.

DO NOT operate a proximity sensor directly from a voltage supply without a load. This is a short circuit and can cause damage.

efector, inc.
a subsidiary of ifm electronic
805 Springdale Drive, Exton PA 19341
Application Engineering and Product Assistance • TEL: 800-348-8899
Ordering Assistance and General Business • TEL: 800-441-8246
Order Placement • FAX: 800-329-0436

Concerning Safety...efector makes every effort to build a dependable product, but every product will eventually fail. Therefore, your equipment must be designed to prevent property damage and personal injury if our products fail. efector proximity switches are not designed to be used as stand-alone devices to protect or guard human life or limb - Prices F.O.B. Exton, PA. Prices and specifications subject to change without notice.

INSTRUCTIONS FOR REPACKING ROTARY SHAFT STUFFING BOXES WITH BRAIDED TEFLON

STEP 1 -- Before installing packing, check shaft alignment and surface finish. Shaft run-out should not exceed 0.005 inches.

STEP 2 -- Packing may be butt or diagonal cut. Stagger joints in successive rings at least 90°.

STEP 3 -- **SLIDE RINGS INTO STUFFING BOX BUT DO NOT TAMP OR DRIVE RINGS INTO PLACE.**

STEP 4 -- **TIGHTEN FOLLOWER GLAND NUTS ONLY FINGER TIGHT AND START EQUIPMENT.**

STEP 5 -- Reduce leakage to desired level by tightening gland follower nuts one flat (1/6 turn) at a time every few minutes.

STEP 6 -- If gland heats up to a temperature that will boil water, back off gland nuts and repeat run-in until temperature stays down after gland nuts are re-tightened.

Honeywell

DR4500A Truline Circular Chart Recorder With or Without Control

Product Manual

Doc. No.:	44-45-25-30
Release:	L
Last Revision Date:	8/02

Honeywell

UDC2500
Universal Digital Controller
Limit Control Model
Product Manual

51-52-25-118

October 2006

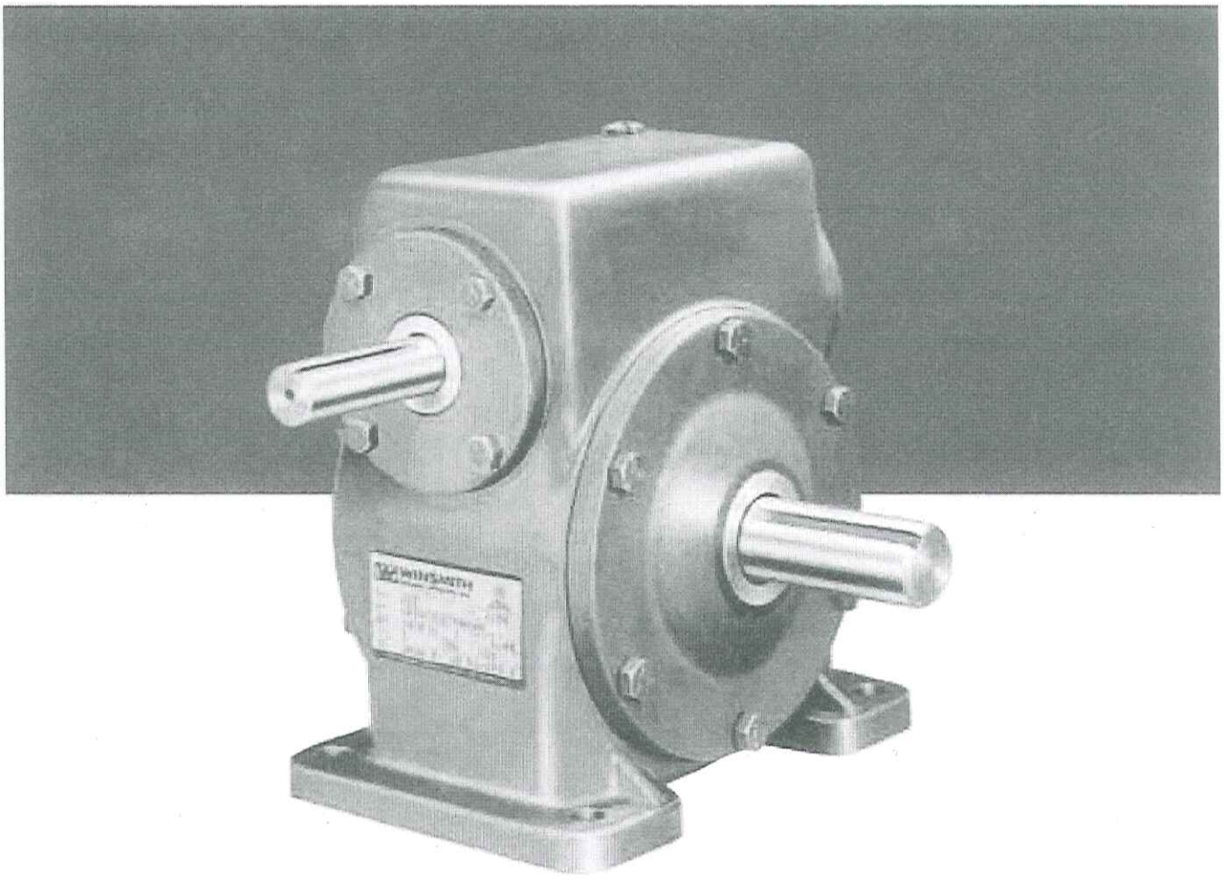
Industrial Measurement and Control

ENGINEERING
SERVICE BULLETIN

ILC-99

WINSMITH
PEERLESS-WINSMITH, INC.

C-LINE
WORM GEAR SPEED REDUCERS



Installation, Operation, and Lubrication Instructions

This Engineering Service Bulletin is designed to enable users to obtain the best possible performance from their WINSMITH® Speed Reducers.

FAFNIR®
Ball Bearing Housed Units

Mounting and Lubrication Instructions

Congratulations! You have just opened the finest, most reliable ball bearing housed unit available. This product is manufactured by American craftsmen in Pulaski, Tennessee, USA.

IMPORTANT

Please read through all instructions carefully before proceeding. Failure to do so may result in premature failure and/or personal injury.

WARRANTY

Torrington will replace, free of charge, within three years from date of sale, any bearing which in its judgement has failed because of defective material or workmanship, provided it has been shown to have been properly mounted, adequately lubricated, and not subjected to abuse in operation or assembling. Such bearings must be returned to the factory, charges prepaid, and with complete information as to service. Torrington assumes no responsibility for contingent or consequential damage in any event.

TORRINGTON MAKES NO OTHER WARRANTY OR REPRESENTATION OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED.

SAFETY INSTRUCTIONS

1. **This product must be properly installed and maintained to perform as intended by the manufacturer.**
2. **Before installation, consult manufacturer's recommendations.**
3. **Failure to adhere to manufacturer's recommendations may result in premature product failure and/or personal injury.**
4. **Store product in a dry and clean area.**
5. **Do not open until ready to use.**
6. **Not to be used in helicopter or nuclear applications.**

The Torrington Company
59 Field Street
PO Box 1008
Torrington, CT 06790-1008
(860) 626-2000

P-333

TORRINGTON
INGERSOLL-RAND

INSTALLATION

1. Ensure that the shaft is clean, free from burrs, straight, and of proper diameter. The bearing should not be mounted on a worn section of the shaft. Use of shafts with hardness greater than **Rc** 45 will reduce effectiveness of locking devices.

   See chart (on reverse side) for recommended shaft tolerances.
2. Align the bearing in its housing and slide the unit into position on the shaft.
3. Bolt housing tightly to its mounting supports using an appropriately sized fastener. Flat washers should be used when installing any kind of housed unit. Washers should be properly sized to bolt diameter and should not be an SAE grade, which are smaller.

   See chart (on reverse side) for proper mounting torques.
4. **Eccentric locking collar bearings:** Slide collar over cammed end of inner ring. Rotate collar to engage cams and lock by tapping lightly with drift pin in the directions of shaft rotation. **For SURVIVOR® bearings use a soft or non-metallic drift pin to avoid damaging the Fafnir TDC® coating on the collar.** Tighten set screw to recommended torque levels as shown in chart (on reverse side).

   In cases where the units are mounted vertically or where they are to assume considerable thrust loading, the unit should be placed so that the collar is forced against the inner ring by the thrust rather than away from it. In these cases it may be advisable to spot the shaft under the set screw.

   To disassemble, loosen set screw and tap collar in direction opposite shaft rotation.
5. **Set screw locking bearings:** Lock bearing to the shaft by tightening each inner ring set screw incrementally to recommended torque levels as shown in the chart (on reverse side). For concentric collar units, tighten each collar set screw to recommended torque levels in charts.

   To disassemble, loosen set screw.
6. SAL/SAOL:

   a. Remove housing cover, gasket, bearing, spacer ring, endplates and packings. Use care when handling gasket and packings. Slide housing and one endplate along shaft. Ensure that the overflow cup, located at the base of the pillow block, is placed on the downward side of shaft rotation. Slide bearing onto shaft and into housing, with cam side outward (facing open end of housing).

   Fixed mounting: Position bearing against housing shoulder and place spacer ring between bearing aligning ring face and housing cover shoulder face.

   Float mounting: Position bearing in center of its floating space between housing and housing cover shoulder faces. Do **NOT** use spacer ring.

   In general, it is preferable for the fixed bearing to be closest to the drive position.

   b. Follow steps three (3) and four (4) to secure bearing to shaft.

   c. Replace gasket and housing cover.

   d. Install packings and endplates. Tighten screws holding endplates to force packings into contact with shaft. This creates an effective seal. **NOTE: Do not overtighten packings.**

   If considerable heat develops during operation, loosen packings by loosening the screws holding endplate.

   e. **To disassemble:** Reverse the above operations to remove bearing from the shaft.

Series RM Rate-Master® Flowmeters

Specifications - Installation and Operating Instructions

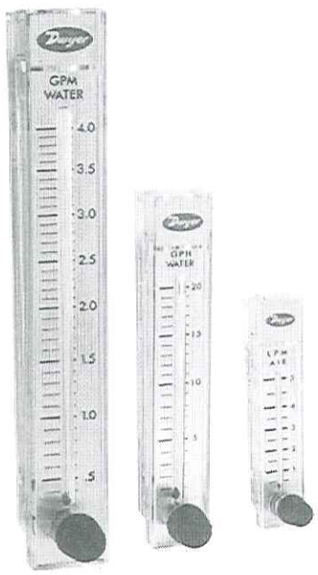


Fig. 1

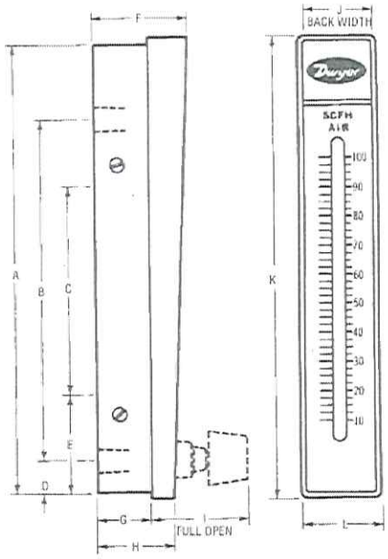


Fig. 2

Dimensions in Inches (Centimeters)			
	Model RMA	Model RMB	Model RMC
A	4 -9/16 (11.59)	8-1/2 (21.59)	15 -1/8 (38.42)
B	3 (7.62) 1/8 NPT CONN.	6-7/16 (16.35) 1/4 NPT CONN.	12 -1/4 (31.12) 1/2 NPT CONN.
C	1-5/8 (3.17) 10 - 32 Thds.	3-15/16 (8.56) 1/4 - 20 Thds.	8-3/4 (10.72) 10 - 32 Thds.
D	3/8 (.95)	5/8 (1.59)	1 (2.54)
E	1-1/16 (2.60)	1-7/8 (3.42)	2-3/4 (5.83)
F	1-3/16 (2.73)	1-3/4 (3.29)	2-1/4 (5.33)
G	3/4 (1.91)	1 (2.54)	1-7/16 (2.98)
H	1 (2.54)	1-7/16 (2.98)	1-31/32 (3.51)
I (OPEN)	1-3/8 (3.49)	1-13/16 (4.60)	2-1/2 (6.35)
J	3/4 (1.91)	1-1/4 (3.18)	2 (5.08)
K	4-13/16 (12.22)	8-3/4 (22.23)	15-3/8 (39.05)
L	1 (2.54)	1-1/2 (3.81)	2-1/4 (5.72)

PANEL CUTOUT FOR FLUSH MOUNTING			
HIGH	4-5/8 (11.75)	8-9/16 (21.75)	15 -3/16 (38.58)
WIDE	7/8 (2.22)	1-5/16 (3.33)	2-1/16 (5.24)
PANEL HOLE SIZES FOR SURFACE MOUNTING			
PIPE	7/16 (1.11)	5/8 (1.59)	15/16 (2.38)
BOLT	1/4 (0.64)	9/32 (0.71)	13/32 (1.03)

Dwyer Series RM Rate-Master® Flowmeters are furnished in three models (see Fig. 2), each available in a broad array of flow ranges with direct reading scales for air, gas or water. Installation, operation and maintenance are very simple. Only a few common-sense precautions must be observed to assure long, trouble-free service.

CAUTION: Dwyer Rate-Master® Flowmeters are designed to provide satisfactory long-term service when used with air, water or other compatible media. Refer to factory for information on questionable gases or liquids. Avoid solutions of acids, bases or salts having a pH below 5.0 or above 8.5. Caustic solutions, antifreeze (ethylene glycol) and aromatic solvents should definitely not be used.

Calibration
Each Rate-Master® Flowmeter is calibrated at the factory. If at any time during the meter's life, you wish to re-check its calibration, do so only with devices of certified accuracy. DO NOT attempt to check a Rate-Master® Flowmeter with a similar flowmeter, as seemingly unimportant variations in piping and back pressure may cause noticeable differences in the indicated reading. If in doubt, return your Dwyer Rate-Master® Flowmeter to the factory. Its calibration will be checked for you at no charge. Before proceeding with installation, check to be sure you have the Rate-Master model and flow range you require.

LOCATION: Temperature, Pressure, Atmosphere and Vibration: Dwyer Rate-Master® Flowmeters are exceptionally tough and strong. They are designed for use at pressures up to 100 psi (6.89 bar) and temperatures up to 130°F (54°C).

DO NOT EXCEED THESE LIMITS! The installation should not be exposed to strong chlorine atmospheres or solvents such as benzene, acetone, carbon tetrachloride, etc. The mounting panel should be free of excessive vibration, as it may prevent the unit from operating properly.

Inlet Piping Run: It is good practice to approach the flowmeter inlet with as few elbows and restrictions as possible. In every case, the inlet piping should be at least as large as the connection to the flowmeter; i.e.,1/8" Iron Pipe Size for RMA models 1/4" IPS for RMB models,1/2" IPS for RMC models. Length of inlet piping makes little difference for normal pressure-fed flowmeters.

For flowmeters on vacuum air service, the inlet piping should be as short and open as possible. This will allow operation near atmospheric pressure and thereby insure the accuracy of the device. (**Note:** for vacuum air service, the flow control valve, if any, should be on the discharge side of the flowmeter. Either the TMV unit or a separate in-line valve may be applied.).

Discharge Piping: As on the inlet, discharge piping should be at least as large as the flowmeter connection. Also, for pressure-fed flowmeters on air or gas service, the discharge piping should be as short and open as possible. This will allow operation of the flow tube at near atmospheric pressure and insure the accuracy of the device. This is of less importance on water or liquid flowmeters, as the flowing medium is generally incompressible and moderate back pressure will not affect the accuracy of the instrument as calibrated.

POSITIONING AND MOUNTING
All Rate-Master® Flowmeters must be mounted in a vertical position with inlet connection at the bottom rear and outlet at the top rear.

Bezel or Through-Panel Mounting: Make panel cutout using appropriate dimensions from Fig. 2. Flowmeter must fit into panel freely without forcing or squeezing. Insert the flowmeter from the front of the panel and install the mounting clamps from the rear. Insert and tighten the clamp bolts in the locations shown in Fig. 3. Do not exceed 5 in./lbs. Make connections to inlet and outlet ports using small amount of RTV sealant or Teflon® thread tape to avoid leakage. Avoid excess torque, which may damage the flowmeter body.

DWYER INSTRUMENTS, INC.
P.O. BOX 373 • MICHIGAN CITY, IN 46361, U.S.A.
Phone: 219/879-8000 www.dwyer-inst.com
Fax: 219/872-9057 e-mail: info@dwyer-inst.com

EVI SERIES INCANDESCENT LUMINAIRES

Installation & Maintenance Information

COOPER Crouse-Hinds

IF 1452

SAVE THESE INSTRUCTIONS FOR FUTURE REFERENCE

APPLICATION

EVI incandescent luminaires are suitable for use in the following hazardous (classified) areas as defined by the National Electrical Code (NEC®), Canadian Electrical Code (CEC):

- Class I Division 1 Groups C & D
- Class I Zone 1 IIB
- Class II Groups E, F, G; Simultaneous Presence
- Class III

Refer to the Luminaire nameplate for specific classification information, maximum ambient temperature suitability and corresponding operating temperature (T-Code).

EVI luminaire Type 4X / IP66 construction is designed for use indoors and outdoors in Marine and Wet locations, where moisture, dirt, corrosion, vibration and rough usage may be present.

EVI301 Series Luminaires are suitable for use with the following MEDIUM base lamps

- 150W A21 maximum
- 200W A23/A25 maximum
- 300W PS25 maximum

EVI301: max supply voltage 120V
EVI301with suffix /250: max supply voltage 250V (for export)

EVI501 Series Luminaires are suitable for use with the following MOGUL base lamps:

- 300W PS35 maximum
- 500W PS40 maximum

EVI501: max supply voltage 277V

⚠ WARNING

To avoid the risk of fire, explosion, or electric shock, this product should be installed, inspected, and maintained by a qualified electrician only, in accordance with all applicable electrical codes.

⚠ WARNING

To avoid electric shock:

Be certain electrical power is OFF before and during installation and maintenance.

Luminaire must be supplied by a wiring system with an equipment grounding conductor.

To avoid burning hands:

Make sure globe and lamp are cool when performing maintenance.

⚠ WARNING

To avoid explosion:

Before opening, electrical power to the luminaire must be turned off. Keep tightly closed when in operation.

Make sure that the supply voltage is the same as the luminaire voltage.

Do not install where the marked operating temperatures exceed the ignition temperature of the hazardous atmosphere.

Do not operate in ambient temperatures above those indicated on the luminaire nameplate.

Install luminaire with lamp base up (within 25 degrees of vertical position).

Use only the lamp type and wattage specified on the luminaire nameplate.

Use proper supply wiring as specified on the luminaire nameplate.

All gasket seals must be clean.

Prevent globe shattering by avoiding scratching or chipping the tempered explosionproof glass.

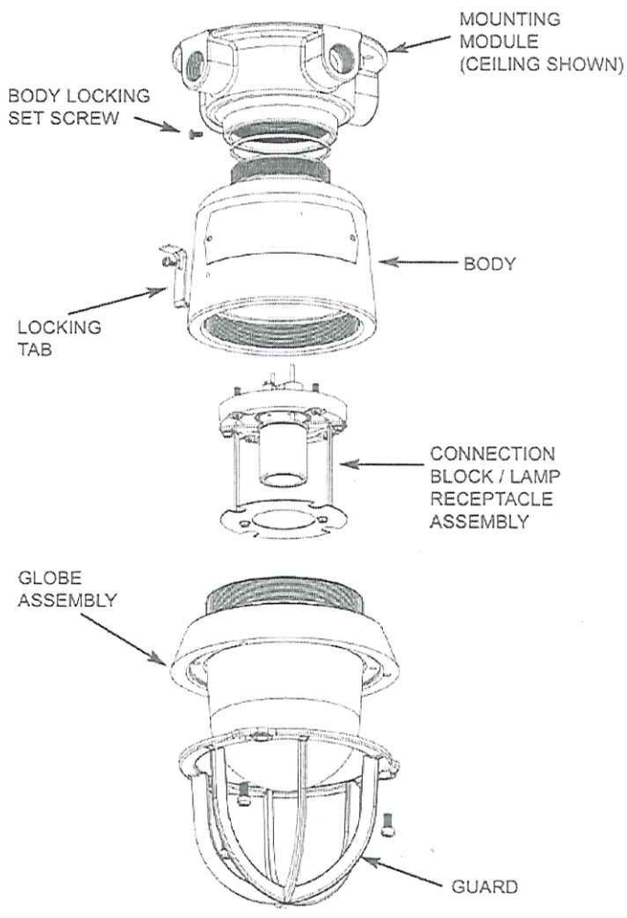


FIGURE 1 - EV1 Luminaire (Ceiling Mount Shown)
Note: Refer to Figure 1 during installation and maintenance

Copyright © 2003, Cooper Industries, Inc.

CLEAN-SIGHT WINDOW

INSTALLATION, OPERATING, AND MAINTENANCE INSTRUCTIONS

INSTALLATION INSTRUCTIONS

The following steps should be followed when installing the Clean-Sight Window.

1. Loosen load spring retaining bolts and remove springs and glass.

2. If Hycar or uncemented Teflon O-ring is supplied, remove O-ring, (if the cemented Teflon O-ring is supplied, do not attempt to remove O-ring from window casing).

3. Cut suitable circular hole in position where window is desired. When selecting window position, be sure there is sufficient clearance for window to slide in both directions.

4. Mount window casing by welding or bolting, using the mounting ring, so that an air tight seal between the window casing and the mounting surface is obtained. Round or square gasket or a suitable sealant may be used to obtain this seal if window is bolted in place. When window is to be mounted in a hollow wall, spacers must be used to keep mounting walls from collapsing. Windows may be mounted so that glass slides either vertically (with retaining bars not shown) or horizontally.

5. If mounted in pairs be sure viewing ports are mounted so glass in both windows has room to be shifted in both directions.

6. Referring to assembly instructions below, reassemble window. Installation is now complete.

7. Because of factory modifications made to the window for either vacuum, pressure of other special applications, windows may not be modified in the field for changes in service.

ASSEMBLY INSTRUCTIONS

The following instructions apply to the assembly of windows having uncemented O-ring gaskets.

1. With loading springs, load spring retaining bolts, retaining plate and glass removed, position seal O-ring over gasket groove.

2. Slide glass over O-ring keeping hand pressure on the glass so O-ring seats properly.

3. Keeping pressure on the glass, position retaining plate and snug down load spring retaining bolts until all bolt heads just contact springs, then tighten all bolts 2 1/2 turns.

4. Slide glass to desired position with ine end of the glass over the window casing and the other in cleaning position.

CAUTION: When moving glass, do not stand directly in front of port opening when vessel is under pressure.

OPERATING PROCEDURE

1. Before shifting viewing glass, clean both sides of the exposed portion of the viewing glass using cloth or steel wool with water or solvent as needed.
   NOTE: Sliding the glass over the O-ring does not have a reliable squeegee glass cleaning effect.

2. Shift the viewing glass using hand pressure as shown in picture or, if required, gently tap glass into position using rubber mallet or a block of wood.

AM Adapter

NEMA Size 56C, 145-365TC, IEC Size 63-280 and Non-TC type NEMA motors

OPERATING INSTRUCTIONS

23 755 01 US

GENERAL

This operating instruction pertains to the mounting of NEMA "TC" and IEC type motors to the AM adapter. The AM adapter is used to mount NEMA type "TC" or IEC flanged motors to SEW-Eurodrive gear reducers. The AM adapter has been designed to allow easy mounting of the motor to the adapter. The AM size corresponds to the compatible NEMA and IEC motor frame designations. If you have any questions concerning this instruction, contact the nearest SEW-Eurodrive Assembly Center.

This operating instruction should be used together with the general operating instruction "Gearmotors and Gear Reducers".

INSTALLATION

With every adapter, SEW-Eurodrive supplies the motor coupling half, a key, a flexible coupling spider and mounting paste. Coat the motor shaft with the mounting paste supplied by SEW (a food grade version, USDA H1, is available upon request). The use of the paste will aid in the mounting of the motor coupling half as well as allow for easier removal of the motor coupling at a later date.

NOTE: The motor coupling must be mounted with the supplied parts. Failure to use the supplied parts could void the SEW-Eurodrive Warranty.

The mounting instructions for the motor coupling half are as follows. Refer to the diagram(s) to the right.

Remove any dirt or adhesive residue from the motor shaft. Apply the SEW supplied mounting paste to the motor shaft.

The SEW supplied key is to be placed in the motor keyway and should be located under the motor coupling.

NOTE: The key is not to extend beyond the coupling bore on the EITHER side.

NEMA Adapter Sizes AM56-AM365

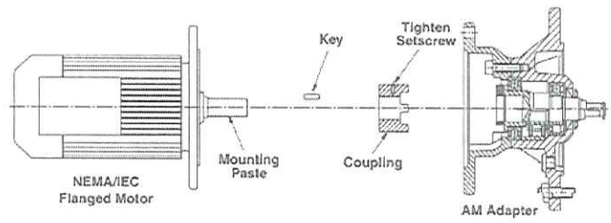
- The motor coupling is to be mounted on the motor shaft and is to be located accordingly (see chart).

IEC Adapter Sizes AM63-AM280

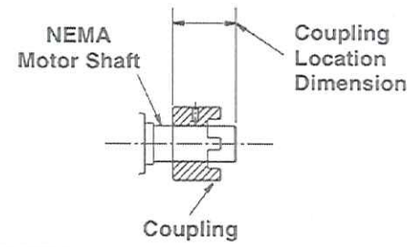
- The motor coupling is to be mounted on the motor shaft and is to be located against the shoulder.

Tighten the setscrew located on the motor coupling.

Place the flexible motor spider between the jaws of the motor coupling. Align the motor coupling so that the jaws on the reducer coupling mesh with the motor coupling. The motor shaft will extend into the bore of the reducer coupling. Secure the flanged motor to the AM adapter with the required hardware specified by the motor manufacturer.



NEMA Adapter Coupling Location



SEW Adapter Size	NEMA Motor Frame	*Coupling Location Dimension (in.)
AM56	56C	1.23
AM143/145	143/145TC	1.68
AM182/184	182/184TC	2.10
AM213/215	213/215TC	2.76
AM254/256	254/256TC	3.65
AM284/286	284/286TC	4.00
AM324/326	324/326TC	3.88
AM364/365	364/365TC	4.51

*Coupling Location Dimension Tolerance is -0.0 / +0.03125

NOTE: For mounting a motor other than a type "TC" NEMA motor to the NEMA AM adapter, please see page 2.

SEW EURODRIVE

SOUTHEAST MANUFACTURING & ASSEMBLY CENTER
1295 Old Spartanburg Highway/Lyman SC 29365
(864) 439-7537 Fax: (864) 439-7830

SOUTHWEST ASSEMBLY CENTER
3950 Platinum Way/Dallas TX 75237
(214) 330-4824 Fax: (214) 330-4724

MIDWEST ASSEMBLY CENTER
2001 West Main Street/Troy OH 45373
(937) 335-0036 Fax: (937) 222-4104

EAST COAST ASSEMBLY CENTER
200 High Hill Road/Bridgeport NJ 08014
(856) 467-2277 Fax: (856) 845-3179

WEST COAST ASSEMBLY CENTER
30599 San Antonio Road/Hayward CA 94544
(510) 487-3560 Fax: (510) 487-6381

Printed in U.S.A.

04/06

Gearmotors and Gear Reducers

OPERATING INSTRUCTIONS

01 805 52 US

GENERAL

These operating instructions are intended to help you install and operate the drive. For trouble free service, proper installation and operation are essential. Additionally, these instructions contain important recommendations on maintenance.

Before shipment, every SEW-Eurodrive gear unit is tested, checked and properly packed. However, please inspect the drive immediately upon arrival for shortage or transit damage. Note the damage or shortage on the freight bill of lading and file a claim with the carrier. Also, notify SEW-Eurodrive of the shortage or damage.

LUBRICANTS

All gearmotors and gear reducers are supplied with the correct grade and quantity of lubricating oil for the specified mounting position. Exceptions include reducers shipped without input assemblies. The recommended lubricants are found on page 2.

LONG TERM STORAGE

If the drive is not installed immediately, it should be stored in a dry, protected area. If the drive is to be stored for an extended period of time and was not ordered from SEW for long term storage, contact your nearest SEW assembly plant for information on Long Term Storage or request **Document #2115**.

Drives which are used for standby service should be stored as a sealed gearcase.

INSTALLATION OF COMPONENTS ON DRIVE SHAFTS

Do not hammer on the shafts. Hammering can cause brinelling of the reducer's bearings shortening the bearing life. We recommend heating the components to approximately 175°F (when possible) and sliding them on the shaft. This will reduce possible damage to the reducer's bearings. **Document #2116**.

For both standard and metric SEW shaft tolerances, refer to the SEW Catalog or request **Document #2154.**

Shaft couplings should be properly aligned to prevent vibration, coupling wear, and premature failure of the shaft bearings.

To prevent the output shaft and bearings from being subjected to excessive loads, the maximum overhung load, as shown in SEW-Eurodrive catalogs, should not be exceeded. Please consult our engineering department if the load may exceed the recommended figure given or where there are combined radial and axial loads. In such cases, the exact operating conditions must be stated including speed, direction of rotation, position, magnitude and direction of the external radial and axial loads being applied.

SHAFT MOUNTED REDUCERS

SEW-Eurodrive supplies the recommended hollowshaft mounting paste with every hollowshaft reducer. The mounting paste is to be applied on the keyed output shaft. The mounting paste is to aid in the prevention of rusting and fretting corrosion between the reducer hollowshaft and the shaft of the driven machine. The mounting paste will aid in shaft removal when necessary.

Warning! Always ensure exposed, rotating parts are properly covered to ensure safety.

For additional information on shaft mounted reducers, drive shaft configuration and tolerances, refer to the SEW-Eurodrive Catalog or request **Documents #2201 and #2202**.

INSTALLATION AND OPERATION

The drive installation site should be selected to ensure:

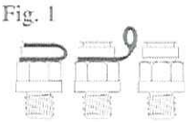
- Ambient temperatures below 40°C (104°F).
- Unimpeded flow of air to the motor and variable speed units.
- Accessibility to the drain, level and breather plugs.
- Adequate space for the removal of brakemotor fanguard for brake adjustment and maintenance.

The drive unit should be mounted on a flat, vibration damping, and torsionally rigid structure. Careful alignment is critical. Mounting to an uneven surface will cause housing distortion. The flatness tolerance of the supporting surface should not exceed:

- For gear units size 80 and smaller — 0.004 inch.
- For gear units above size 80 — 0.008 inch.

For transportation, the units are supplied with the breather plug already mounted. After the unit is installed, the black rubber seal located on the breather MUST BE REMOVED (Fig. 1). In addition, the oil level should be checked. Remove the plated (non-painted) oil level plug. The oil level is correct when the surface of the oil is level with the lowest point of that tapped hole, the exception is S37. Units W10, W20 and W30 are sealed in any position.

Fig. 1



After installation, the actual mounting position should be confirmed against the mounting postion shown on the gear reducer nameplate. Adequate lubrication is only guaranteed if the unit is mounted in the specific nameplated mounting position.

Refer to the SEW Catalog or request **Document #2111, #2112, #2113, or #2114 (R, F, K, or S, respectively)** if a specific mounting position diagram is needed.

MAINTENANCE

Warning! Always ensure equipment is secure and electrical power is off before removing or performing maintenance on the drive assembly. Oil levels and oil quality should be checked at regular intervals, determined by usage and the environment. Grease and oil should be changed per the recommendations on page 2. Check coupling alignment, chain or belt tension, and mounting bolt torque periodically. Keep the drive relatively free of dust and dirt.

For additional information, call the SEW FAXline, 1-800-601-6195, and request document number shown.

SEW EURODRIVE

SOUTHEAST MANUFACTURING & ASSEMBLY CENTER
1295 Old Spartanburg Hwy, Lyman, SC 29365
(864) 439-7537 Fax: (864) 439-7830

SOUTHWEST ASSEMBLY CENTER
3950 Platinum Way, Dallas, TX 75237
(214) 330-4824 Fax: (214) 330-4724

MIDWEST ASSEMBLY CENTER
2001 West Main Street, Troy, OH 45373
(937) 335-0036 Fax: (937) 332-0038

EAST COAST ASSEMBLY CENTER
200 High Hill Road, Bridgeport, NJ 08014
(856) 467-2277 Fax: (856) 330-4724

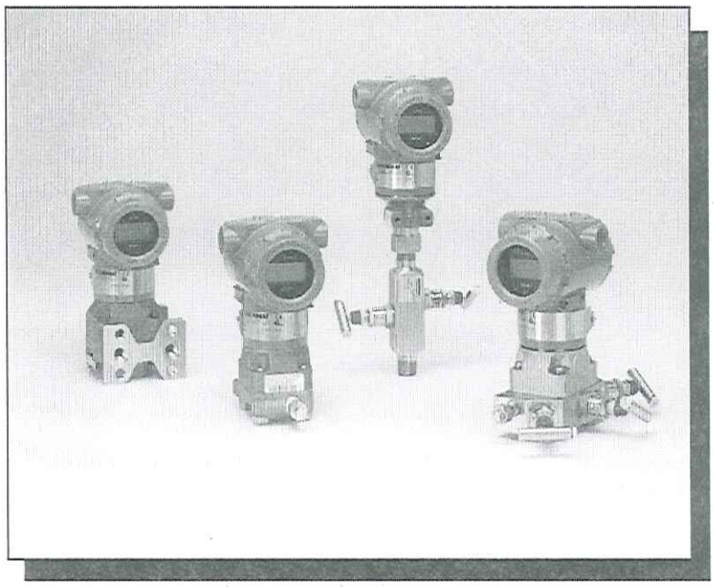
WEST COAST ASSEMBLY CENTER
30599 San Antonio Road, Hayward, CA 94544
(510) 487-3560 Fax: (510) 487-6381

ISO 9002

Reference Manual
00809-0100-4001, Rev EA
December 2002

Model 3051 Pressure Transmitter

with HART protocol®



HART
FIELD COMMUNICATIONS PROTOCOL

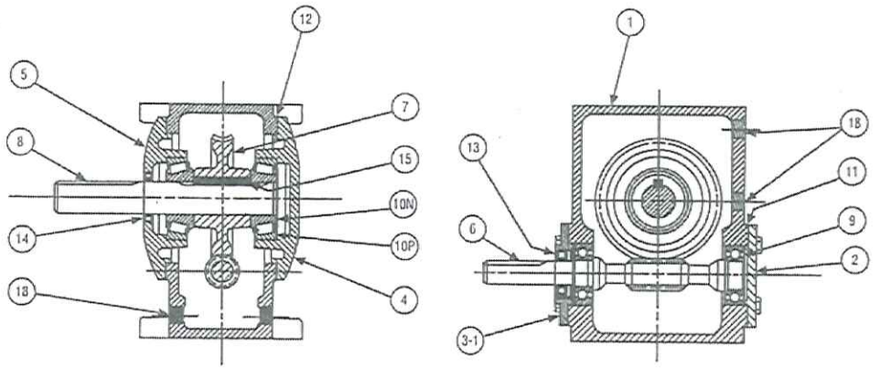
ROSEMOUNT

www.rosemount.com

EMERSON
Process Management

Universal Series Parts Lists
Single Reduction

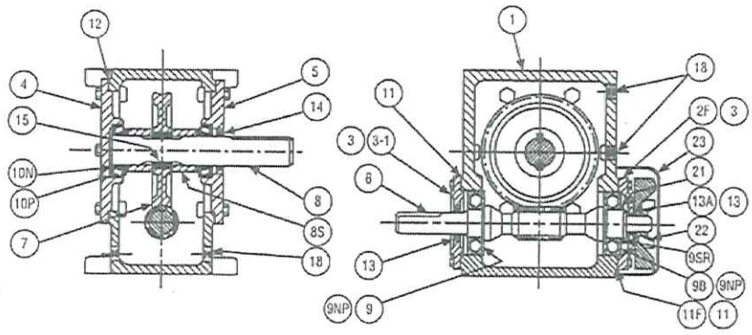
Styles SB, ST, SV – Sizes 133 through 300



Item No.	Quantity	Description
1	1	Housing
2	1	Worm gland-closed
3-1	1	Worm gland-open
4	1	Gear gland-closed
5	1	Gear gland-open
6	1	Worm and shaft integral
7	1	Worm gear-bronze forging
8	1	Worm gear shaft-single proj.
8A	1	Worm gear shaft-double proj. (not shown)
9	1	Worm shaft ball bearing

Item No.	Quantity	Description
10N	2	Output shaft taper roller bearings
10P	2	Output shaft bearing cup
11	4	Input gland gaskets
12	4	Output gear gland gaskets
13	1	Input worm shaft oil seal
14	1	Output gear shaft oil seal
15	1	Gear shaft key
17	1	Vent plug (not shown)
18	6	Oil level and drain plugs
20	1 pr.	Angle feet for SV mtg. (not shown)

Styles SB, ST, SV – Sizes 350 through 600



Item No.	Quantity	Description
1	1	Housing
2F	1	Worm gland-open (350-400 only)
3	1	Worm gland-open (500-600 only)
3-1	1	Worm gland open (350-400 only)
4	1	Gear gland-closed
5	1	Gear gland-open
6	1	Worm and shaft integral
7	1	Worm gear-bronze forging
8	1	Output gear shaft single ext.
8A	1	Output gear shaft double ext. (not shown)
8S	2	Gear shaft spacers
9	1	Input shaft-bearing front (350-400 only)
9B	1	Input shaft-bearing rear (350-400 only)
9N	2	Input shaft-taper roller bearing (500-600 only)
9P	2	Input shaft-bearing cup (500-600 only)
9SR	1	Input shaft-snap ring (350-400 only)

Item No.	Quantity	Description
10N	2	Output shaft taper roller bearing cone
10P	2	Output shaft bearing cups
11	2	Worm gland-gaskets
11F	2	Input gland-gaskets (350-400 only)
12	4	Gear gland gaskets
13	1	Input motor flange oil seal-front (front & rear 500 and 600 only)
13A	1	Input shaft oil seal-rear (350 and 400 only)
14	1	Gear shaft oil seal
15	2	Gear shaft keys
17	1	Vent plug (not shown)
18	6	Oil level and drain plugs
20	1 pr.	Angle feet for SV mtg. (not shown)
21	1	Input shaft washer
22	1	Fan
23	1	Fan guard

tyco

Flow Control

KEYSTONE

Spring Return and Double Acting Pneumatic Quarter-turn Actuators Operations Manual

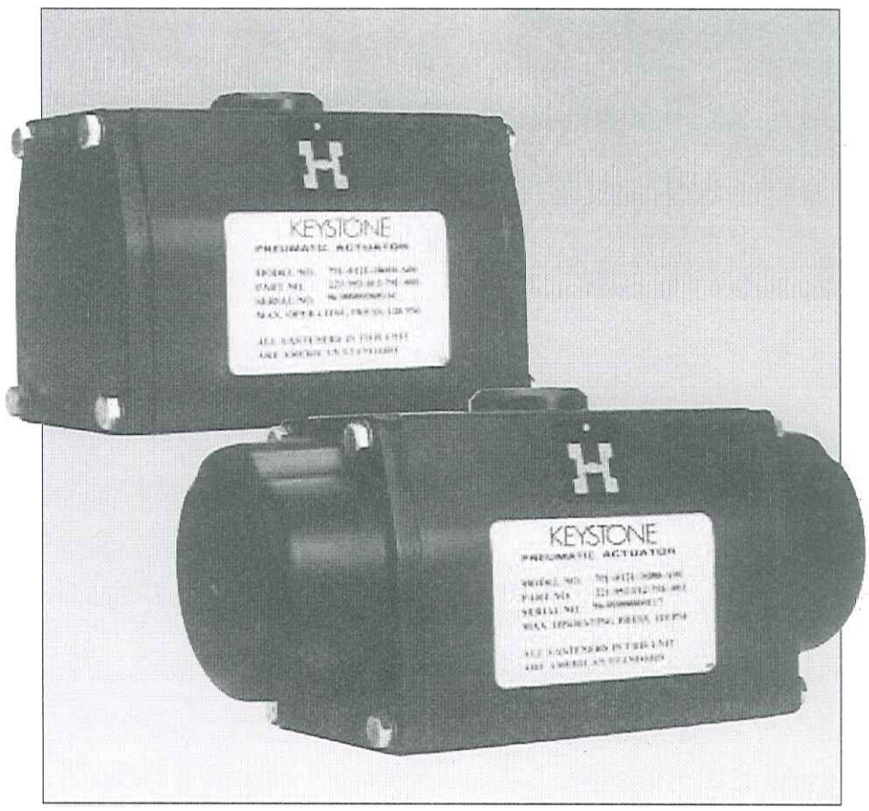


Table of Contents

General

The Figure 79U incorporates design features based on well-proven engineering concepts. This value-engineered product line is available with mounting details according to ISO 5211 (with unified threads) for the Figure 79E. Figures 79U and 79E series actuators are rated for air pressure in the range of 40 psig (2.75 barg) to 120 psig (8.3 barg) and can withstand a maximum of 150 psig (10 barg).

Pneumatic Recommendations

All Keystone and Tyco pneumatic actuators are factory-lubricated with 'Pneumatic Actuator Lubricant' and, unless the operating environment is extremely poor, additional lubrication should not be required. To maintain maximum efficiency with this, or other pneumatic actuators or pressure vessels, Tyco Valves & Controls advises following these recommendations:

1. Where air pipelines are subjected to extremes of temperature, the system should be fitted with air-drying equipment.
2. Air control lines should be run to a 'Recommended Piping Practice' and should not have exaggerated loops that can trap condensate.
3. All pipe ends should be thoroughly deburred and cleaned after cutting, ensuring that the pipeline is clear of cuttings.
4. If pipelines are hydraulically tested, the lines should be 'blown down' with high pressure air to clear all water. This action must be performed prior to connecting the lines to the actuators.
5. When pipe fitting sealants are used, they should be applied to the male threads only. Failure to do so could foul the actuator control lines. If sealant is applied to female threads, excess compound could be transmitted into the lines.

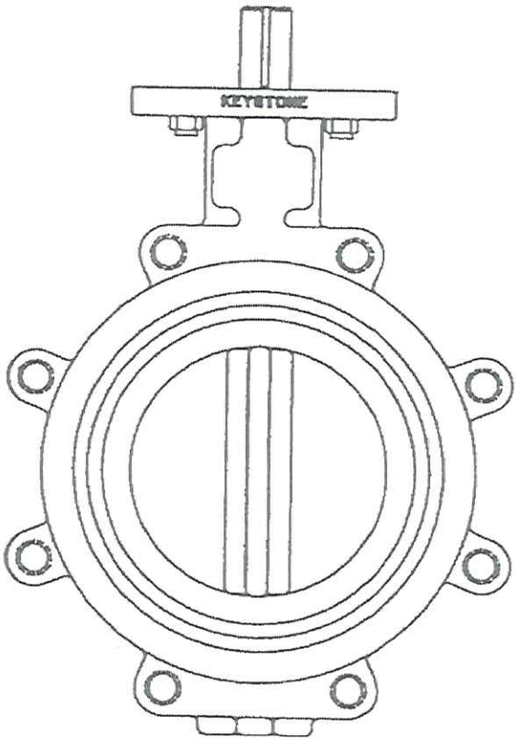
Tyco reserves the right to change product designs and specifications without notice.
Copyright © 2000 by Tyco International Ltd. Publication #946 KM7U 2/00

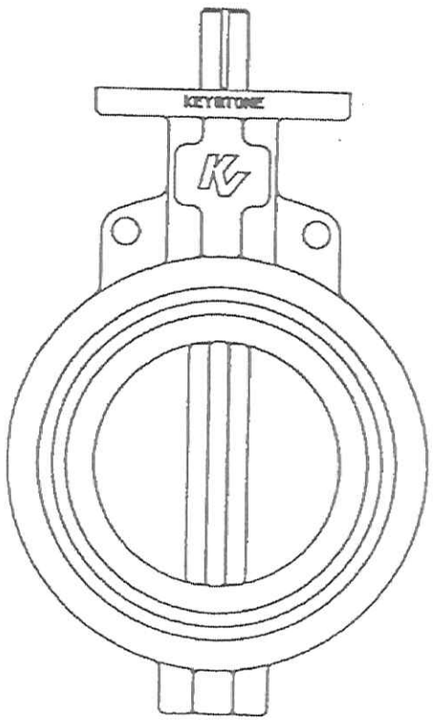
KEYSTONE

VALVE USA, INC.

AR1/AR2-0
REV. 2 7/95

AR1/AR2
2" – 36"
INSTALLATION AND MAINTENANCE MANUAL

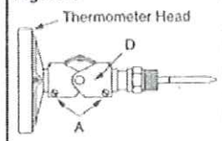




INSTRUCTIONS FOR REPOSITIONING AND INSTALLING MODELS AA-375R, AA-475R and AA-575R

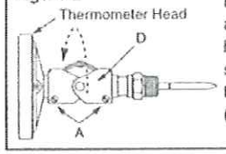
Thermometer head orientation can be adjusted by rotating the harness assembly up to 360°.

Figure 1



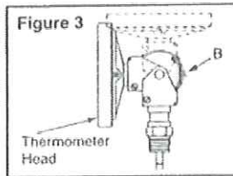
Thermometer head orientation can be adjusted **ONLY** when in the straight, back-connected position as shown in Figure 1. Loosen two screws (A) until harness (D) revolves freely.

Figure 2



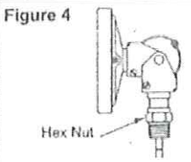
Hold thermometer head and harness (D), rotate harness to desired position as shown in Figure 2. Tighten two screws (A) until harness (D) is secure.

Figure 3



To tilt thermometer head up to 90° angle, loosen single screw (B) **1/2 turn ONLY**. Tilt to desired angle and tighten screw (B) as shown in Figure 3.

Figure 4



To install thermometer into threaded connection, always tighten with wrench on hex nut as shown in Figure 4.

CAUTION: NEVER use head of thermometer or adjustment harness as a handle for tightening. SEVERE DAMAGE to thermometer will result.

World-Class Thermometers | *Since 1916*

www.teltru.com

01204003

TEL-TRU MANUFACTURING CO.
World-Class Thermometers

INDUSTRIAL THERMOMETERS
Operating and Calibrating Instructions

Models:
LN-250, LN-250R, GT-300, GT-300R, GT-400, GT-400R, GT-500, GT-500R, MX-325R, MX-525R, MM-325R, MM-525R, BC-350R, BC-450R, BC-550R, AA-375R, AA-475R and AA-575R

Tel-Tru Manufacturing Company
408 St. Paul Street, Rochester, New York 14605 USA
Phone: 585-232-1440 • 800-232-5335 • Fax: 585-232-3857
E-mail: info@teltru.com • Web: www.teltru.com

GENERAL INFORMATION

- This thermometer is constructed of type 304 stainless steel.
- Helix coil is silicone coated on ranges below 500°F for vibration dampening and to maximize heat transfer and response time.
- Glass lens is standard. Other lens options available.
- Hermetic seal per ASME B40.3 dustproof and leakproof.
- Accuracy is ±1% full span per ASME B40.3 Grade A. Adjustment of the angle between case and stem may affect accuracy up to 0.5% of span (ASME B40.3).
- Over temperature limits - up to 250°F 100%; 250°F to 550°F, 50%; 550°F 1000°F, continuous use up to 800°F, intermittent use over 800°F.
- For accurate reading thermometer must be immersed PAST GROOVE on lower portion of stem.

TEL-TRU MANUFACTURING CO.
World-Class Thermometers

www.teltru.com

CAUTION

- Any severe shock to the thermometer dropping, bending of the stem or head, etc., can possibly impair its accuracy.
- When installing thermometer into threaded connection, always tighten with wrench on hex nut (NEVER use the head of the thermometer for tightening).

CALIBRATING INSTRUCTIONS

1.) A master thermometer with a high degree of accuracy should be used for calibrating.
2.) Place thermometer to be calibrated alongside a master thermometer. Immerse both thermometers into an agitated liquid for at least 3 minutes. Compare temperatures. **IMPORTANT** For accurate reading thermometer must be immersed PAST GROOVE on lower portion of stem. Master thermometer should also be immersed to same depth.

NOTE: Models LN-250, GT-300, GT-400 and GT-500 cannot be recalibrated.

LN-250R

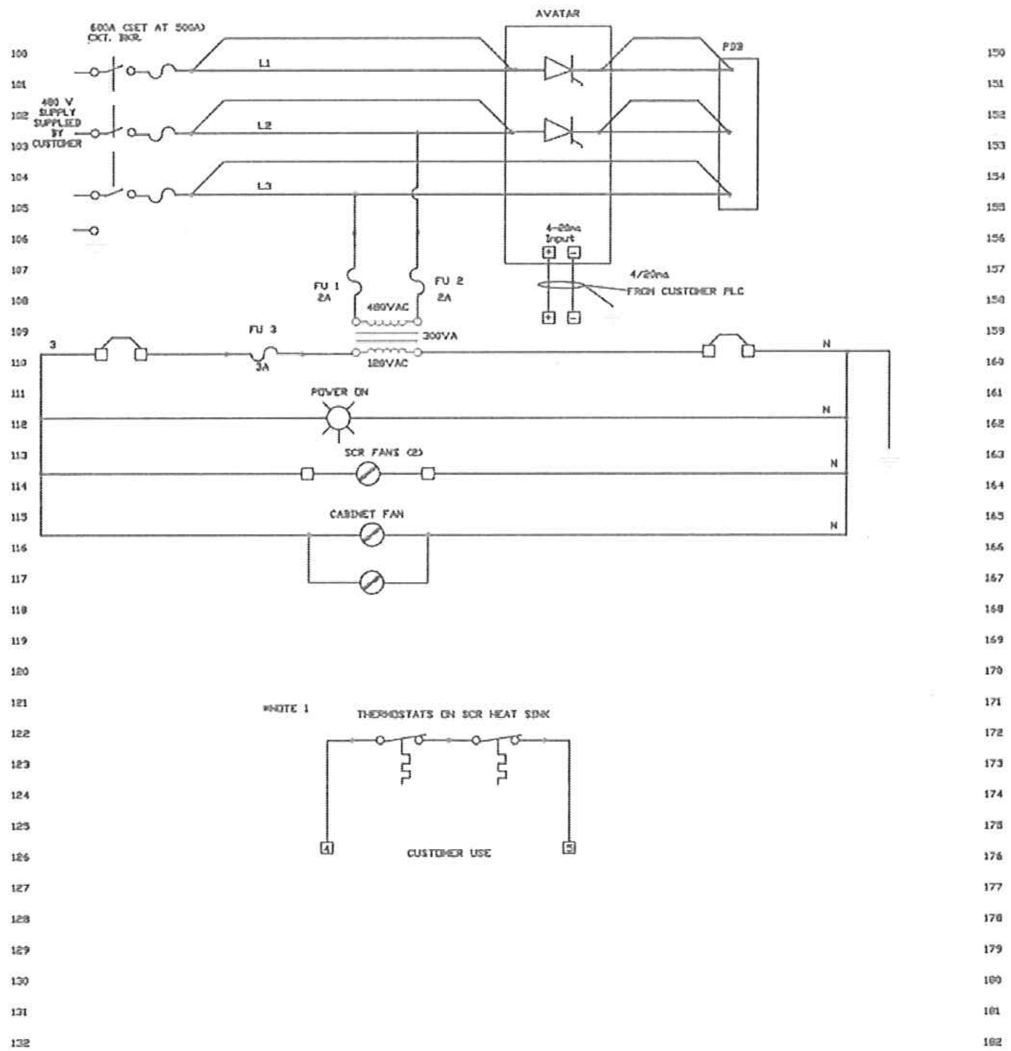
1.) Using 5/64" hex key loosen socket head screw (just above hex nut) 1/2 to 1 turn.
2.) Place wrench on hex connecting nut beneath head. Hold head and turn until pointer is at exact temperature.
3.) Tighten socket head screw.

GT-300R, GT-400R, GT-500R, MX-325R, MX-525R, MM-325R, MM-525R, AA-375R, AA-475R and AA-575R

1.) A socket opening "RESET" is provided on bottom side of the thermometer case.
2.) Insert 1/16" hex key into RESET opening, turn key until pointer is moved to exact temperature.
3.) Remove hex key.

BC-350R, BC-450R and BC-550R

1.) Using 3/32" hex key loosen two socket head screws (just above hex nut) 1/2 to 1 turns.
2.) Place wrench on hex connecting nut beneath head. Hold head and turn until pointer is at exact temperature.
3.) Tighten socket head screws.



BOM

NO.	DESCRIPTION	QTY
1	ENCL-SCE 36EL3612LP OR EQUIL	1
2	PANEL SCE 36P30	1
3	CKT. BKR. ABB S6N600BV	1
4	SHAFT ASSMBLY OXP10X500	1
5	HANDLE OHB125J10	1
6	TRANSF-MICRON B300BTZ13RB-300VA	1
7	FILTER ASSBLY	2
8	GUARD	2
9	FAN MC-MASTER 106 CFM 120VAC	2
10	PDB-MARATON-1453129	1
11	PILOT LIGHT EB2 HV3X0 LED	1
12	FUSE CCMR 3.5	1
13	FUSE CCMR2	2
14	TERMBL. WEIDMULLER WDU4	4
15	AVATAR SCR-A3Z-48-600	1

REV	DESCRIPTION	DATE

AVATAR INSTRUMENTS BROOMALL, PA

DRAWING TITLE
480V 500A (285KW)

CUSTOMER:
WYSSMOUNT COMPANY

PROJECT NO: (J530)SPD-000050-CT19

DRAWN BY JA | CHECKED BY BB

DATE 2/16/07 | SCALE: NTS | REV

DRAWING NUMBER
5260-5909 | 0

4525 E. Industrial Street
Unit 4C
Simi Valley, CA 93063
Phone 805-582-0065
Fax 805-582-0210

G C
VALVES

S402 SERIES PILOTED PISTON TYPE SOLENOID VALVE — 2-WAY N.O.

INSTALLATION, SERVICE AND PARTS LIST

SDI/SDP S402-1

DESCRIPTION

S402 Series are 2-way piloted piston operated solenoid valves, with Standard brass or Optional stainless steel body construction. Both feature stainless steel seats. Positive shutoff is assured by using spring loaded plunger and synthetic seating materials such as Buna N, Viton, Teflon or Rulon. Valves are designed for use with air, gas, liquids, steam and other flow media not corrosive to brass, stainless steel or the selected seating material. Valves' construction features make them suitable for automatic control of hydraulic lifts, machine tools, car washers, combustion, laundry, dry cleaning and welding equipment.

S402 Series solenoid valves are available as Standard with General Purpose (NEMA Type 1 Enclosure). Rainproof (NEMA Type 3R) or a combination Explosion Proof and Watertight (NEMA Types 4, 7 and 9) solenoid enclosures are available as OPTIONS, as well as other non-NEMA enclosures.

OPERATION

Valves are Normally Open (N.O.) types, that is they close when electrically energized and open when de-energized.

When solenoid is electrically energized, the plunger pushes down pilot valve onto its seat, and closes off the orifice. Fluid pressure above piston builds up until it equalizes with pressure underneath. The plunger then pushes down the piston, through the push rod, thus closing the valve.

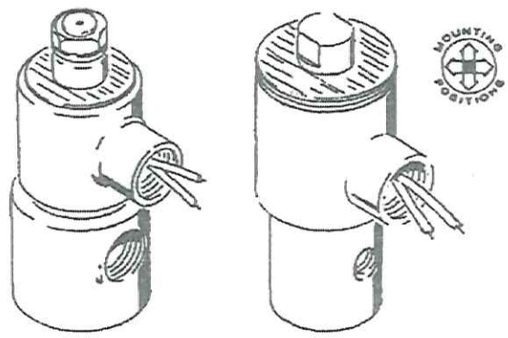
When solenoid is electrically de-energized, push rod kickoff spring lifts the push rod off the piston orifice. As the piston orifice is opened, pressure above piston bleeds off, and the piston return spring is now able to push up the piston and open the valve.

SPECIFICATIONS

OPERATING TEMPERATURES

FLUID MEDIA	COIL CLASS	MAXIMUM TEMPERATURE °F		SEAT MATERIAL
		FLUID	AMBIENT	
GAS	M (105C)	185	77	BUNA
LIQUIDS	F (155C)	200	150	
OIL	M (105C)	185	77	
	F (155C)	230	150	VITON
	H (220C)	185	176	
	M (105C)	185	77	
	F (155C)	230	150	TEFLON
	H (220C)	185	176	RULON
	H (220C)	257	125	
	F (155C)	298	77	TEFLON
STEAM	H (220C)	338	77	RULON
	H (220C)	257	125	

For other applications, consult factory.



Standard Model Explosion Proof Model

Fig. 1. Typical S402 Valve

Use valve within specified operating ranges as indicated on nameplate and in complete catalog number. (Min/Max. psi, volts, cycles, published flow data.)

INSTALLATION

⚠ WARNING ⚠

This valve is normally open (N.O.) to flow when not powered. Do not use in place of normally closed (N.C.) valve.

Check valve specifications to ensure proper application.

MOUNTING POSITIONS

Valves are multipoised and, therefore, may be mounted in any position except that:

Valves with "W" (Rainproof Enclosure) in 5th digit position of valve catalog number must be mounted on a horizontal pipe line with solenoid in an upright position.

PIPING

All piping must meet applicable local codes and ordinances or the National Fuel Gas Code (ANSI 223:1/NFPA No. 54).

Connect pipe to valve with flow in accordance with the port designation on valve body. Apply thread sealant to male pipe threads only. Applying sealant to valve threads may result in sealant entering and blocking the valve open, or cause other operational problems.

Do not use solenoid valve as a lever when tightening pipe.

TERMS AND CONDITIONS

All products of the company are sold and all services of the company are offered subject to the company's terms and conditions of sale, copies of which will be furnished upon request.

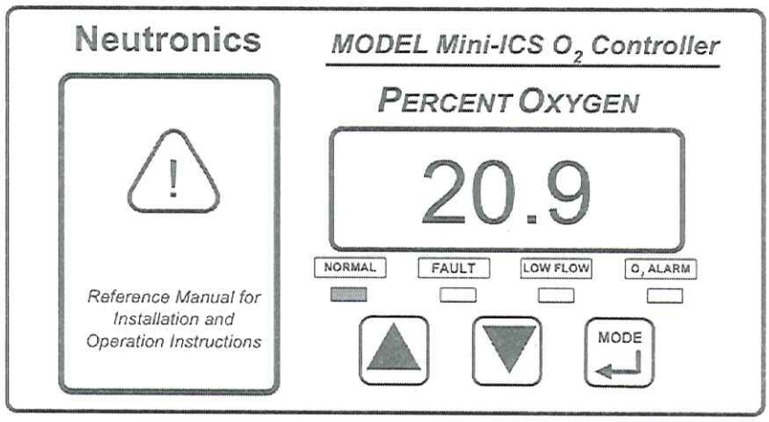
NEUTRONICS INC.

Engineered Solutions for Gas Detection and Analysis

MODEL Mini-ICS

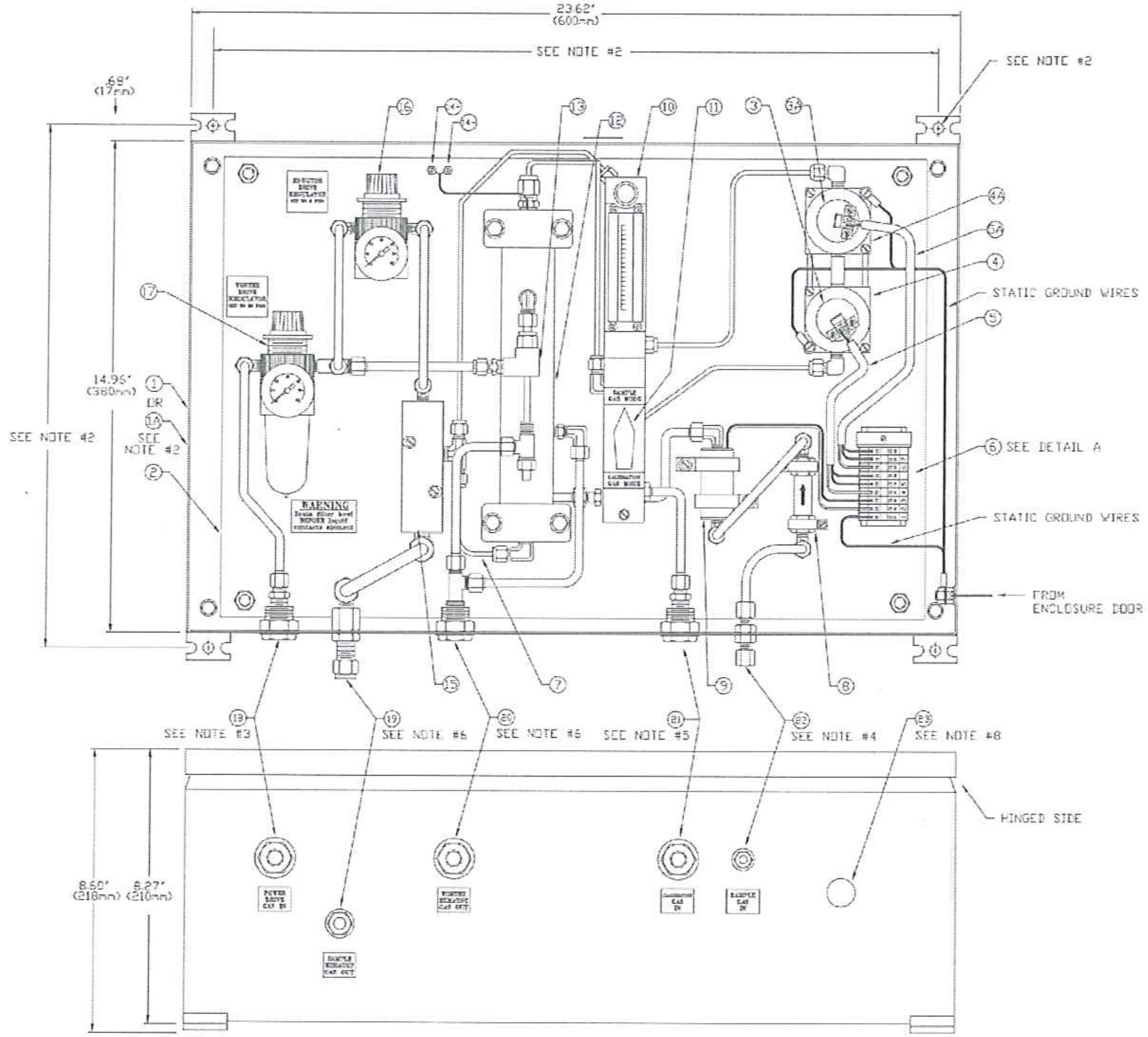
OXYGEN ANALYZER / CONTROLLER - PERCENT RANGE

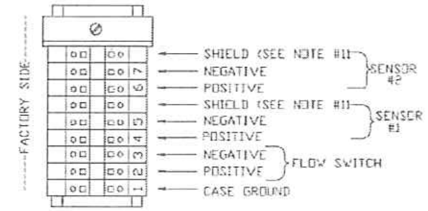
OPERATIONS MANUAL



Manual Part Number: 5-06-4900-53-0
Document Control Number: MN-A-0031
Revision Level: B - ECO 7822
Revision Date: April 14, 2006

NTRON A DIVISION OF NEUTRONICS INC.
456 Creamery Way, Exton, PA 19341
Phone: 610.524.8800 • Fax: 610.524.8807 • Email: info@neutronicsinc.com
www.neutronicsinc.com



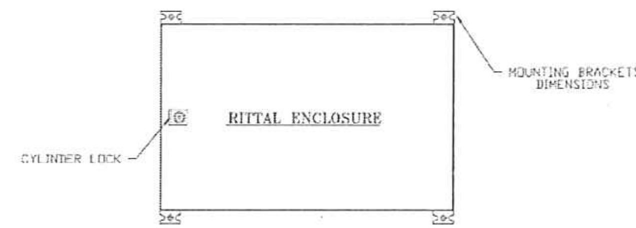


DETAIL A
CUSTOMER ELECTRICAL CONNECTIONS

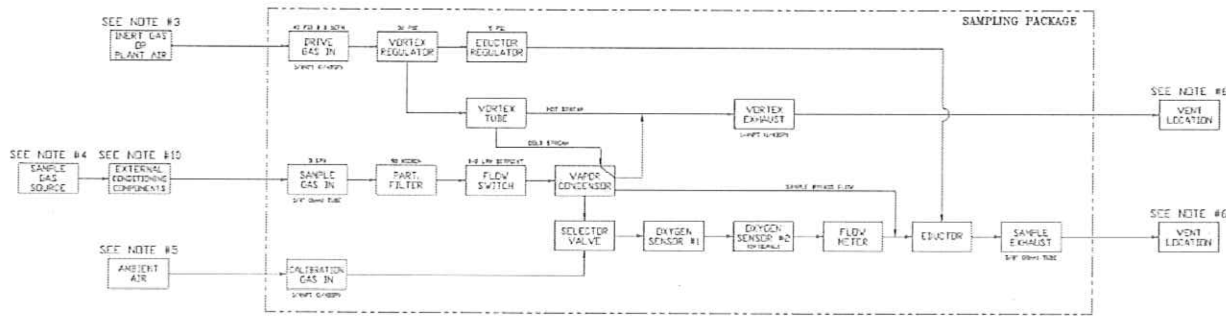
ITEM #	ITEM DESCRIPTION	REPLACEMENT PART # OR REF.
1	NEMA 4/IP55 ENCLOSURE	-----------
1A	NEMA 4X/IP65 ENCLOSURE	-----------
2	COMPONENT MOUNTING PANEL	-----------
3	OXYGEN SENSOR #1	SP-E-0504
3A	OXYGEN SENSOR #2 (OPTIONAL)	SP-E-0504
4	SENSOR MOUNTING HEAD #1	-----------
4A	SENSOR MOUNTING HEAD #2 (OPTIONAL)	-----------
5	SENSOR SIGNAL HARNESS #1	8-01-1000-00-0
5A	SENSOR SIGNAL HARNESS #2 (OPTIONAL)	8-01-1000-00-0
6	ELECTRICAL SIGNAL TERMINAL BLOCK (IP20)	-----------
7	SAMPLE GAS BYPASS LINE (TEFLON)	-----------
8	SAMPLE PARTICULATE FILTER, 90 MICRON	SP-E-0505
9	SAMPLE FLOW SWITCH (PASSIVE DEVICE)	-----------
10	SAMPLE FLOW (SET TO 100 mLPM)	-----------
11	OPERATIONAL SELECTION VALVE	-----------
12	VAPOR CONDENSING SYSTEM HEAT EXCHANGER	-----------
13	VAPOR CONDESING SYSTEM VORTEX TUBE	-----------
14+	POSITIVE THERMOCOUPLE OUTPUT	-----------
14-	NEGATIVE THERMOCOUPLE OUTPUT	-----------
15	SAMPLE EDUCTOR	-----------
16	EDUCTOR DRIVE GAS REGULATOR (SET TO 5 PSIG)	-----------
17	VORTEX TUBE DRIVE GAS REGULATOR (SET TO 30 PSIG)	SP-E-0506
18	DRIVE GAS INPUT PORT, 1/4NPT (1/4BSP)	-----------
19	SAMPLE EXHAUST PORT, 3/8" (10mm) TUBE COMPRESSION	-----------
20	VORTEX EXHAUST PORT, 1/4NPT (1/4BSP)	-----------
21	CALIBRATION GAS INPUT PORT, 1/4NPT (1/4BSP)	-----------
22	SAMPLE GAS INPUT PORT, 1/4" (6mm) TUBE COMPRESSION	-----------
23	ELECTRICAL INTERFACE PORT, .87" (22mm) DIAMETER	-----------

NOTES:

1. REFERENCE SYSTEM MANUAL BEFORE ATTEMPTING INSTALLATION, START-UP, OPERATION, OR MAINTENANCE TO AVOID LOSS OF WARRANTY.
2. ENCLOSURE WILL MOUNT ON 21.31W x 16.31H x .41" DIA (541 x 414 x 10mm) DIMENSION (REFERENCE DETAIL B FOR IDENTIFICATION)
3. DRIVE GAS TO BE SUPPLIED AS INSTRUMENT QUALITY PLANT AIR OR INERT GAS. INSTRUMENT QUALITY GAS DEFINED AS:
   * DEW POINT: LESS THAN 35°F (2°C)
   * PARTICULATE SIZE: LESS THAN 3 MICRON
   * CONDENSABLE HYDROCARBONS: LESS THAN 1PPM
4. SAMPLE GAS INPUT TO SYSTEM TO BE RELATIVELY CLEAN, DRY, AND OIL FREE. REFERENCE SYSTEM MANUAL FOR EXTERNAL CONDITIONING COMPONENTS.
5. SYSTEM REQUIRES AMBIENT AIR AT 20.9% OXYGEN FOR CALIBRATION PURPOSES.
6. SYSTEM EXHAUST PORTS TO BE CONNECTED TO A SUITABLE VENTING LOCATION. ONLY SYSTEMS WHICH UTILIZE INERT GAS AS THE DRIVE GAS SOURCE MAY BE PLUMBED BACK TO THE SAMPLE SOURCE. VENTING LOCATIONS MUST MEET BACK PRESSURE REQUIREMENTS AS STATED IN SYSTEM MANUAL.
7. DOCUMENT DEPICTS ALL COMPONENT OPTIONS. ACTUAL ORDERED SYSTEM MAY VARY. CONSULT SPECIFIC ORDER DETAILS FOR SYSTEM CONFIGURATION.
8. CUSTOMER ELECTRICAL INTERFACE IS SPECIFIED BY SYSTEM WIRING SCHEMATIC. CUSTOMER TO INTERFACE THROUGH ENTRANCE PORT, ITEM #23. CUSTOMER TO SEAL ITEM #23 IN ORDER TO MAINTAIN ENCLOSURE RATING.
9. REFERENCE THE FOLLOWING DOCUMENTATION FOR SYSTEM MAINTENANCE:
   SP-E-0504: SENSOR REPLACEMENT DETAIL
   SP-E-0505: PARTICULATE FILLTER ELEMENT REPLACEMENT DETAIL
   SP-E-0506: FILTER/REGULATOR FILTER ELEMENT REPLACEMENT DETAIL
10. TYPICAL EXTERNAL PRECONDITIONING COMPONENTS INCLUDE PREFILTERS, SCRUBBERS, REMOTE CALIBRATION SOLENOID, DEMISTERS, ETC. REFER TO SYSTEM MANUAL FOR COMPONENT INSTALLATION DETAILS.
11. SENSOR SIGNAL SHIELDED CONNECTIONS:
    a) FOR SYSTEMS INTERFACED WITH PASSIVE BARRIERS (STAHL) CONNECT SHIELD TO BARRIER GROUND (EARTH GROUND)
    b) FOR SYSTEMS INTERFACED WITH ACTIVE BARRIERS (P&F) DO NOT MAKE ANY SHIELD CONNECTIONS. SHIELDING IS TO BE ACHIEVED VIA TWISTED PAIRS BY CUSTOMER.



DETAIL B
(NOT TO SCALE)



PNEUMATIC DIAGRAM

REV	DATE	ECO #	CHANGE DESCRIPTION	APP. INT.	APP. DATE
K	[illegible]	[illegible]	SEE ECO	SWW	[illegible]
J	[illegible]	[illegible]	SEE ECO	EJR	[illegible]
I	[illegible]	[illegible]	REMOVE REFERENCE TO HOFFMAN ENCLOSURE	SWW	[illegible]
H	[illegible]	[illegible]	[illegible] EDUCTOR/REGULATORS AND CONVERSION FROM BRASS TO STAINLESS STEEL		
G	[illegible]	[illegible]	ADD ITEM 1A TO P/L AND NOTE #2	JJH	[illegible]
F	[illegible]	NONE	CHG ITEM 10 TO READ 100 mLPM	JJH	[illegible]
E	[illegible]	NONE	MINOR SPELLING CORRECTIONS	JDA	[illegible]
D	[illegible]	[illegible]	ADDED SENSOR SHIELDED TERMINALS	JDA	[illegible]
C	[illegible]	[illegible]	SEE ECO	JDA	[illegible]
B	[illegible]	NONE	CALIBRATION PORT TO 1/4NPT	JDA	[illegible]
A	[illegible]	NONE	PRODUCT RELEASE	JDA	[illegible]

EDUCTOR DRIVEN SAMPLING PACKAGE
GP OXYGEN RANGE SERIES
DETAIL/INSTALLATION DRAWING

SCALE: N/A
DATE: 3/17/89
APPROVED BY: J.D. ANDERSON
DRAWN BY: JDA
JOB NO: STANDARD.

NTRON A NEUTRONICS COMPANY

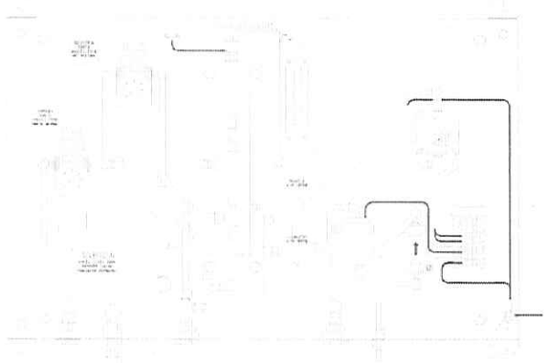
DRAWING NUMBER: SP-E-0503 REV: K

SAMPLE CONDITIONING PACKAGE

FOR MEASUREMENT OF OXYGEN DEPLETED ATMOSPHERES
RANGE: 0-25 % OXYGEN

This system is intrinsically safe for installation In Class 1 & 2, Divisions 1 & 2, Groups-B, C D E, F, & G hazardous areas.

Sample Conditioning Package Part Number: 7-04-3000-03-0
Sample Conditioning Package Model Number: 31-609-123000-2



Installation, Operation and Maintenance Manual
Manual Part Number: 5-06-3900-07-0
Revision: D

a Neutronics Company
456 Creamery Way
Exton, PA 19341 USA
Phone: 610-524-8800 • Fax: 610-524-8807
E-Mail: sales@NeutronicsInc.com
www. NeutronicsInc.com

DUTY MASTER ALTERNATING CURRENT MOTORS

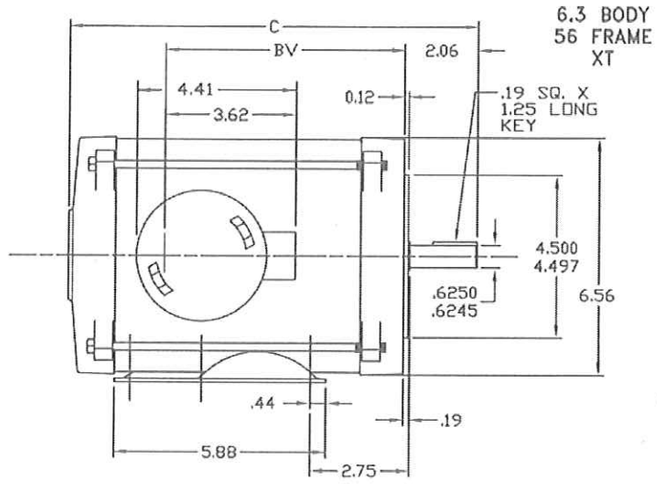
SQUIRREL-CAGE INDUCTION

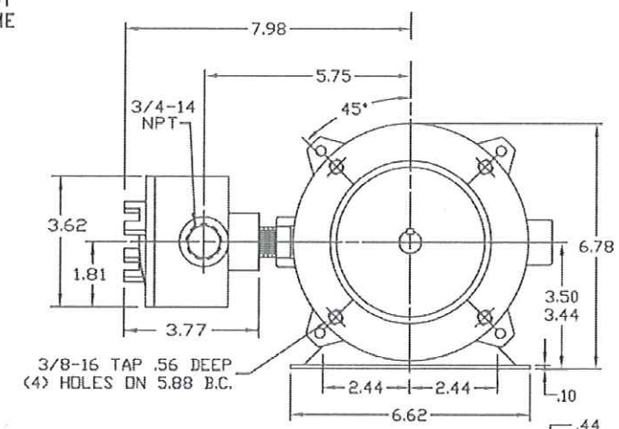
ENCLOSURE: EXPLOSION-PROOF

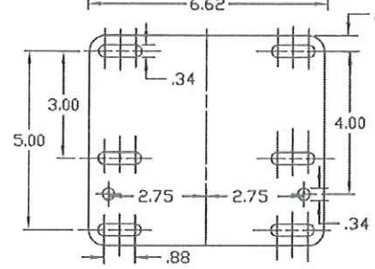
COOLING: NON-VENT

MOUNTING: RIGID OR ROUND BODY
NEMA 'C' FACE

TYPE: P







OMIT BASE ON ROUND BODY MOTORS.

DIMENSIONS ARE IN INCHES

FACE RUNOUT AND ECCENTRICITY .004 MAX. T. I. R.
SHAFT RUNOUT .002 MAX. T. I. R.

FRAME	C	BV
HF56C	15.43	10.68
HE56C	14.43	9.68
HD56C	13.43	8.68
HC56C	12.37	7.62
HB56C	11.37	6.62

FRAME- _____ TYPE- _____ CERTIFIED FOR- _____

ORDER- _____ ITEM- _____ HP- _____ RPM- _____ PH- _____ HZ- _____ VOLTS _____

RELIANCE SALES ORDER- _____ APPROVED BY- _____ DATE _____

RELIANCE ELECTRIC
CLEVELAND, OHIO 44117 U.S.A.

DR. BY D. SUDHOFF
CK. BY T. THOMPSON
APP. BY D. SUDHOFF
DATE 5-31-06

DIMENSION SHEET 600703-173
ISSUE DATE 5-31-06

C/R 312565-Y

FILENAME: E:\DS_AC\600703\173.DWG

DISTRIBUTION: ASD

Installation and
Operation Manual

Fractional Horsepower Duty Master® A-C Motors

- Type CS, Capacitor Start
- Type P, Polyphase
- 1/8 Thru 3 hp
- 48-56-140T

Reliance
Electric

A-C MOTORS

We're keyed to your need.

Instruction Manual B-3622-13

June, 1988

REL. S.O.	FRAME	HP	TYPE	PHASE/ HERTZ	RPM	VOLTS
-	56/140	1/2	P	3/60	1725	230/460

AMPS	DUTY	AMB °C/ INSUL.	S.F.	NEMA DESIGN	CODE LETTER	ENCL.
1.8/.9	CONT	40/F	1.00/1.15	-	N	NV/FC

E/S	ROTOR	TEST S.O.	TEST DATE	STATOR RES.@25 °C OHMS (BETWEEN LINES)
500357-40	602482-66-C	EDM85269	5/6/03	8.45/33.8

PERFORMANCE

LOAD	HP	AMPERES	RPM	% POWER FACTOR	% EFFICIENCY
NO LOAD	0	.70	1798	10.5	0
1/4	.20	.78	1790	35.0	69.0
2/4	.30	.84	1785	44.0	74.0
3/4	.40	.87	1778	53.0	79.0
4/4	.59	1.0	1768	67.0	81.4
5/4	.96	1.4	1744	82.3	82.0

SPEED TORQUE

	RPM	TORQUE % FULL LOAD	TORQUE OZ.-FT.	AMPERES
LOCKED ROTOR	0	242	68.0	7.2
PULL UP	200	231	65.0	7.0
BREAKDOWN	1500	380	107	6.5
FULL LOAD	1756	100	28.1	1.1

AMPERES SHOWN FOR 460. VOLT CONNECTION. IF OTHER VOLTAGE CONNECTIONS ARE AVAILABLE, THE AMPERES WILL VARY INVERSELY WITH THE RATED VOLTAGE

REMARKS:

RELIANCE ELECTRIC

DR. BY W. A. EWING
CK. BY W. A. EWING
APP. BY M.SWINNEY
DATE 5/14/03

A-C MOTOR PERFORMANCE DATA M8331A ISSUE DATE 5/14/03

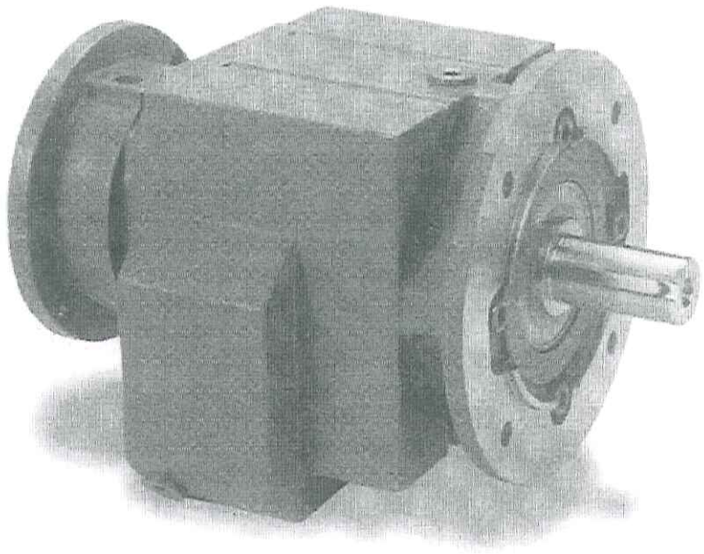
Printed on 4/24/07 12:54 @ psecs-motorer

Installation and Instruction Manual
For

DODGE® QUANTIS®
IN-LINE HELICAL REDUCER

Gearmotors
C-Face Reducers
Separates

For Sizes 38 thru 168



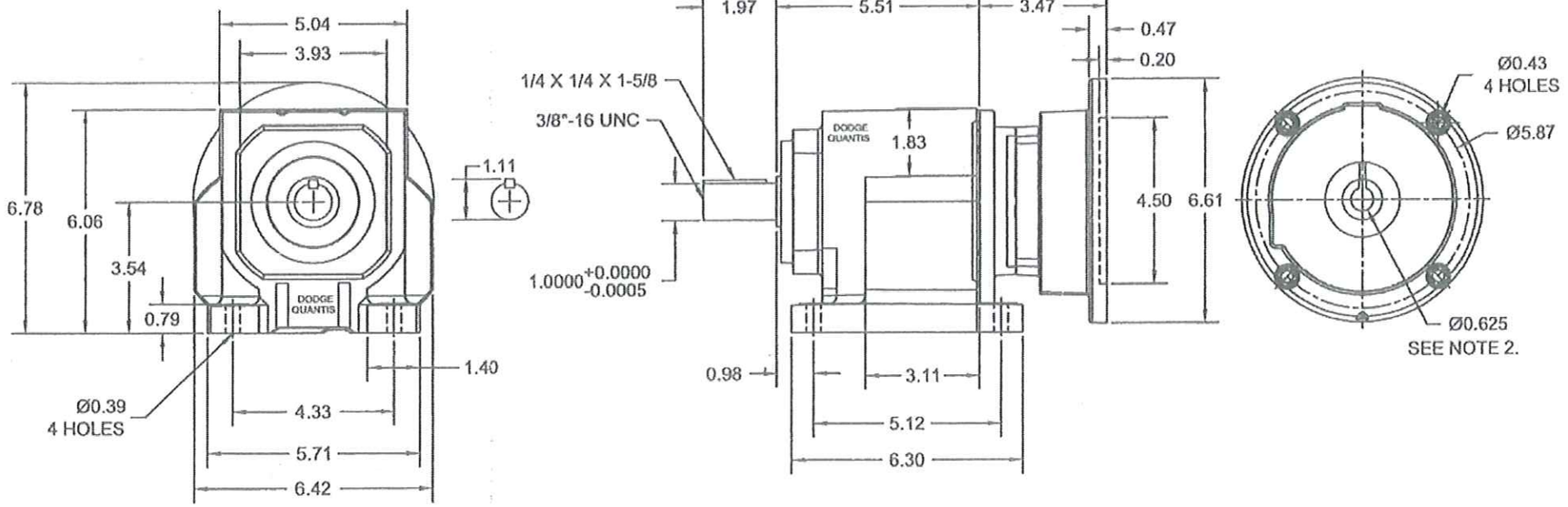
WARNING: Because of the possible danger to person(s) or property from accidents which may result from the improper use of products, it is important that correct procedures be followed. Products must be used in accordance with the engineering information specified in the catalog. Proper installation, maintenance and operation procedures must be observed. The instructions in the instruction manuals must be followed. Inspections should be made as necessary to assure safe operation under prevailing conditions. Proper guards and other suitable safety devices or procedures as may be desirable or as may be specified in safety codes should be provided, and are neither provided by Rockwell Automation nor are the responsibility of Rockwell Automation. This unit and its associated equipment must be installed, adjusted and maintained by qualified personnel who are familiar with the construction and operation of all equipment in the system and the potential hazards involved. When risk to persons or property may be involved, a holding device must be an integral part of the driven equipment beyond the speed reducer output shaft.

DODGE QUANTIS ILH C-FACE REDUCER

IN-LINE HELICAL - SIZE 38 - 2 STAGE
MOTOR FRAME SIZE 56C - CLAMP COLLAR
STANDARD INCH SHAFT - 1.000"

CERTIFIED

REDUCER ONLY
TAG:



NOTES:
1. THIS DRAWING COVERS ALL RATIOS OF THIS CONFIGURATION.
2. REFERENCE NEMA MOTOR DIMENSIONS.
3. APPROXIMATE WEIGHT OF UNIT - 28 LBS.
4. WHEN CLOSE CLEARANCES ARE REQUIRED, CONSULT FACTORY.

REVISED: 3/5/01

QUANTIS ILH HB382CN56C/ S-I-1.000"

Rockwell Automation

DODGE

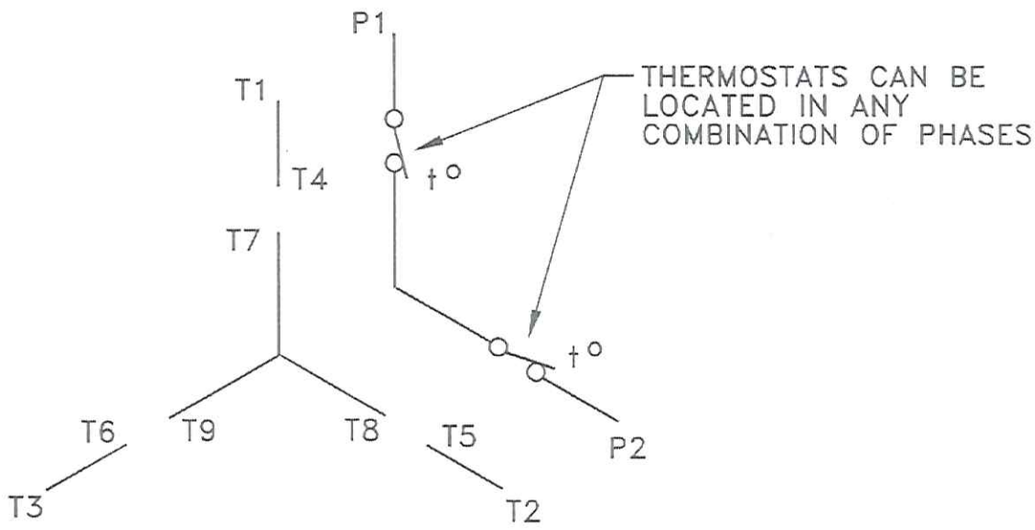
DR. BY	JRA	DATE	3/25/99
CK. BY	JRA	DATE	3/25/99
AP. BY	JRA	DATE	3/25/99

DRAWING NO.
AS0120

AUTOCAD FILENAME: AS0120

A–C MOTOR
CONNECTION DIAGRAM

STANDARD POLYPHASE Y CONNECTED
WITH TWO NORMALLY CLOSED THERMOSTATS IN SERIES



LOW VOLTAGE	HIGH VOLTAGE
P1, P2 — THERMOSTAT LEADS	P1, P2 — THERMOSTAT LEADS
T1, T7 — L1	T1 — L1
T2, T8 — L2	T2 — L2
T3, T9 — L3	T3 — L3
T4, T5, T6	T4, T7
	T5, T8
	T6, T9

TWO REVERSE ROTATION INTERCHANGE ANY TWO LINE LEADS

CUSTOMER _____ CUSTOMER ORDER NO. _____ RELIANCE S.O. NO. _____

RELIANCE ELECTRIC
CLEVELAND, OHIO 44117

DR. BY N.F.JUESCHKE
CK. BY N.F.JUESCHKE
APP. BY R.G.CRANE
DATE 6-1-83

CONNECTION DIAGRAM

416820–87
ISSUE DATE MAY 31, 1983

C/R 335017

E:\W-DIAG\416820\087 RAG

10-541-04

DUTY MASTER ALTERNATING CURRENT MOTORS

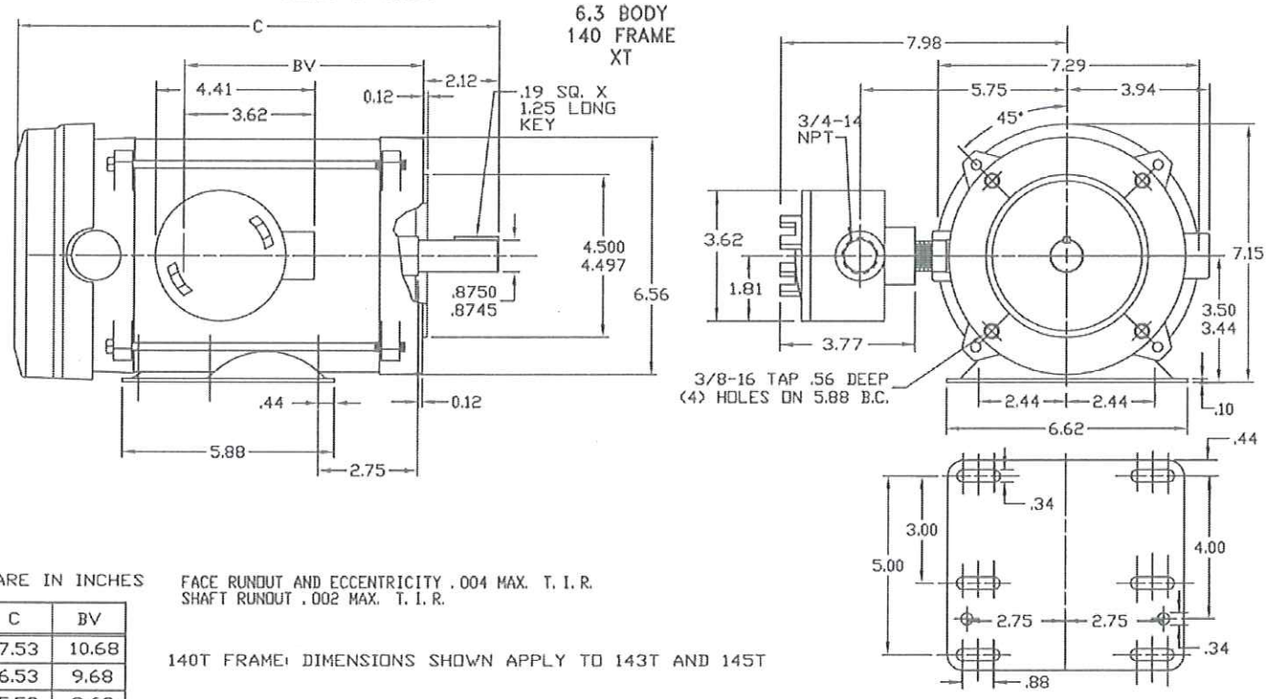
SQUIRREL-CAGE INDUCTION

ENCLOSURE: EXPLOSION-PROOF

COOLING: FAN-COOLED

MOUNTING: RIGID OR ROUND BODY
NEMA 'C' FACE

TYPE: P & CS



DIMENSIONS ARE IN INCHES

FRAME	C	BV
HF140TC	17.53	10.68
HE140TC	16.53	9.68
HD140TC	15.53	8.68
HC140TC	14.47	7.62
HB140TC	13.47	6.62

FACE RUNOUT AND ECCENTRICITY .004 MAX. T. I. R.
SHAFT RUNOUT .002 MAX. T. I. R.

140T FRAME: DIMENSIONS SHOWN APPLY TO 143T AND 145T

FRAME- _____ TYPE- _____ CERTIFIED FOR- _____

ORDER- _____ ITEM- _____ HP- _____ RPM- _____ PH- _____ HZ- _____ VOLTS _____

RELIANCE SALES ORDER- _____ APPROVED BY- _____ DATE _____

RELIANCE ELECTRIC
CLEVELAND, OHIO 44117 U.S.A.

DR. BY D. SUDHOFF
CK. BY T. THOMPSON
APP. BY D. SUDHOFF
DATE 5-22-06

DIMENSION SHEET 600702-254
ISSUE DATE 5-22-06

C/R 312563-R

FILENAME: E:\DS_AC\600702\254.DWG

DISTRIBUTION: ASD

REL. S.O.	FRAME	HP	TYPE	PHASE/ HERTZ	RPM	VOLTS
-	56/140	2.0	P	3/60	1725	230/460

AMPS	DUTY	AMB °C/ INSUL.	S.F.	NEMA DESIGN	CODE LETTER	ENCL.
5.4/2.7	CONT	40/B-F	1.0-1.158	B	H	FC/PROT

E/S	ROTOR	TEST S.O.	TEST DATE	STATOR RES.@25 °C OHMS (BETWEEN LINES)
50035739.00	603482-66-X	EDM85265	4/7/03	2..7/10.8

PERFORMANCE

LOAD	HP	AMPERES	RPM	% POWER FACTOR	% EFFICIENCY
NO LOAD	0	1.5	1799	9.00	0
1/4	.53	1.6	1788	37.5	81.9
2/4	1.03	1.9	1775	59.0	86.9
3/4	1.55	2.3	1761	72.3	87.4
4/4	2.02	2.7	1753	79.8	86.8
5/4	2.54	3.3	1730	83.9	84.8

SPEED TORQUE

	RPM	TORQUE % FULL LOAD	TORQUE LB.-FT.	AMPERES
LOCKED ROTOR	0	206	12.5	19.0
PULL UP	300	204	12.4	18.5
BREAKDOWN	1400	322	19.5	13.1
FULL LOAD	1753	100	6.06	2.7

AMPERES SHOWN FOR 460. VOLT CONNECTION. IF OTHER VOLTAGE CONNECTIONS ARE AVAILABLE, THE AMPERES WILL VARY INVERSELY WITH THE RATED VOLTAGE

REMARKS: NEMA NOM EFF=84.0%, MINIMUM EFF=81.5% P.F. 80%
208-230/460 VOLTS 6.0-5.4/2.7 AMPS

RELIANCE ELECTRIC

DR. BY W.A. EWING
CK. BY W. A .EWING
APP. BY M.SWINNEY
DATE 4/09/03

A-C MOTOR PERFORMANCE DATA M8328
ISSUE DATE 4/09/03

MARATHON ELECTRIC
A Subsidiary of Regal-Beloit Corporation

P.O. Box 8003
Wausau, WI 54401-8003
PH:(715) 675-3311

Certification Data Sheet

(DATA IS BASED ON 460 VOLTS)

Model #: 56T17G5317
Winding: ZT406
Outline Drawing: B-104188-681
Connection Diagram: A-EE7335

NP HP:	1	**DESIGN:**	B	**Frame:**	56C
NP VOLTS:	460	**FREQ:**	60 HZ	**Max Load Inertia:**	7 (lb ft²)
NP AMPS:	1.8	**LR CODE:**	L	**Approx Mtr Wgt:**	30
NP RPM:	1730	**95% PF Corr:**	1	**Rotor Inertia:**	0.056 (lb ft²)
NP EFF:	77%	**Sound @ 1M:**	62 dBA	**Starts/Hour:**	2 (NEMA WK2)
NP PF:	68.4%	**Ambient**	40 C	**Stall Time:**	12 Sec
GTD EFF:	74%	**Service Factor:**	1.00	**Insulation:**	B
Thermal Protection:	NONE			**Duty:**	CONTINUOUS

EQUIVALENT WYE CKT. PARAMETERS (OHMS PER PHASE)

R1	R2	X1	X2	XM
11.01144	7.69098	12.6291	9.05322	204.6198

RM	ZREF	XR	TD	TD0
31.9	283.8	1.29	0.004	0.074

	AMPS	KW	RPM	TQ(lb-ft)	EFF(%)	PF(%)	R/R(C)
No LD	1	.12	1800	0	0	11.5	0
N/A	1	.51	1775	1.5	73.5	45	0
N/A	2	.72	1755	2.2	77	60	0
1.0 LD	2	.93	1730	3	77	68.4	55
1.15 LD	2	1.1	1725	3.5	77	71	70

	MTR AMPS	NEMA AMPS	MTR TQ	NEMA TQ	PF (%)
L.R.	12	694	333 %	11333 %	73
B.D.	8.2	456	400 %	13900 %	83.5

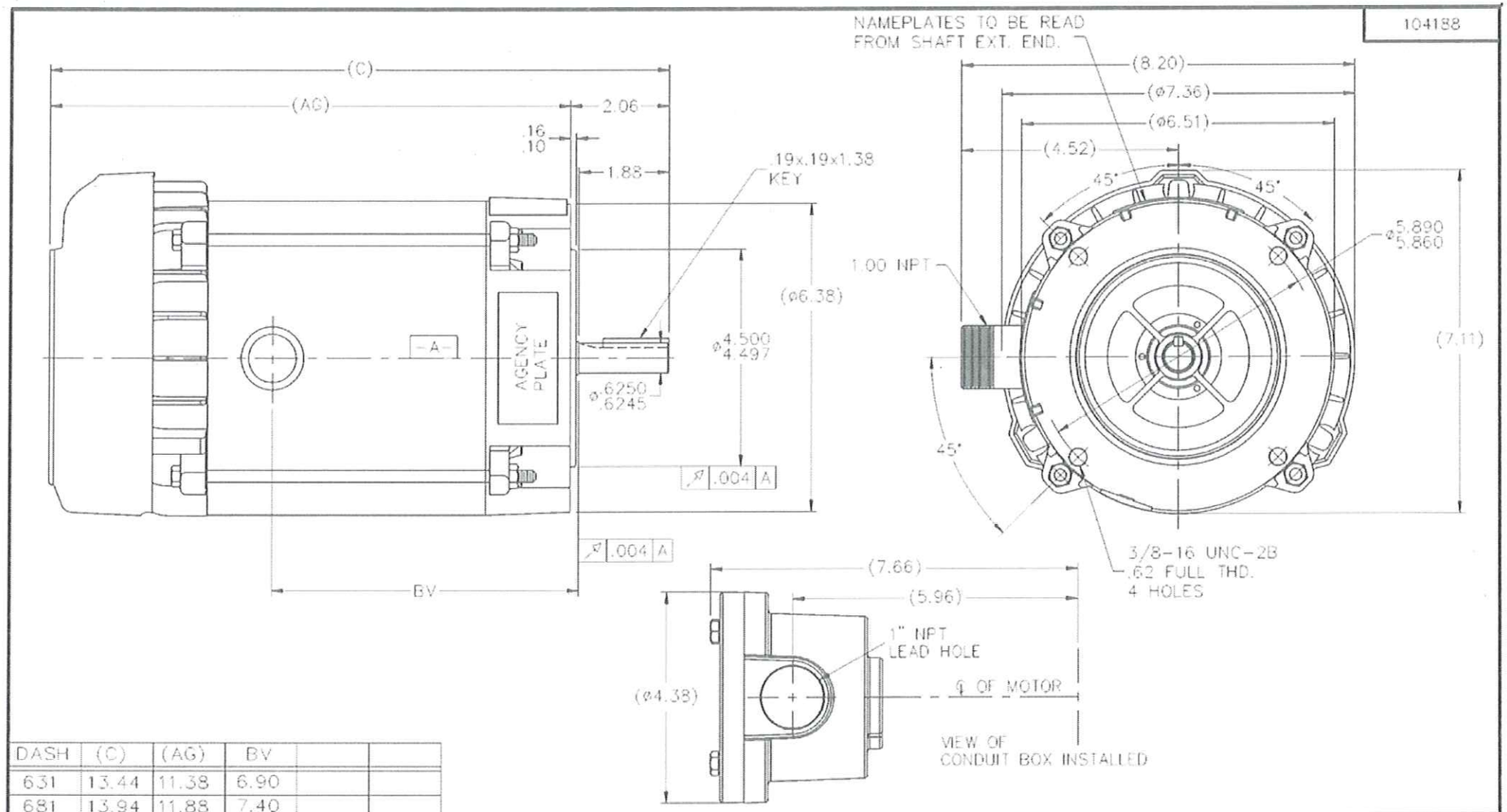
Mechanical Information

Shaft Material:	STANDARD	**Mounting:**	ROUND
Enclosure:	EPFC	**Electrical Type:**	STANDARD
Frame:	56C	**Spaceheaters:**	NONE
Frame Material:	ROLLED STEEL	**Orientation:**	HORIZONTAL
Shaft:	T	**Conduit Assembly:**	F1
Grease:	STANDARD	**Bearings DE:**	
Hazardous Location:	EXP PROOF CL I GR C&D CL II GR F&G T3B	**Bearings ODE:**	

FORM 4118 8-20-2002 *Date Printed: 5/18/2007*

The Above is Typical, Sinewave Power Data Unless Stated Otherwise.

104188



DASH	(C)	(AG)	BV		
631	13.44	11.38	6.90		
681	13.94	11.88	7.40		
731	14.44	12.38	7.90		
781	14.94	12.88	8.40		
831	15.44	13.38	8.90		
881	15.94	13.88	9.40		
931	16.44	14.38	9.90		
981	16.94	14.88	10.40		

NO	REVISION	BY & DATE	CHK
4	REVISED CBOX PER CN407844A	JJB 02/23/2007	ML
3	REDRAWN IN AUTOCAD	TAT 08-28-2004	ML
2	ADDED CONDUIT BOX VIEW CN 20686	MRB 03-22-1999	
1	NEW DRAWING CN 20099	MH 12-07-1998	

TOLERANCES UNLESS SPECIFIED

DEC	INCHES
X	±.1
XX	±.03
XXX	±.005
XXXX	±.0005
ANG	±7.30'

MARATHON ELECTRIC

TITLE OUTLINE - 'C' FACE
56 FR. - EXP. PR.

MATL
FINISH
CAD FILE 104188

DRAWN MH 11-21-1996
CHK ML 11-25-1998
APPD GK 12-02-1998
SCALE 1/7=.32
WT
PMF
PREV

SIZE B | DRAWING NO. 104188 | PAGE OF | REV 4

THIS DRAWING IN DESIGN AND DETAIL IS OUR PROPERTY AND MUST NOT BE USED EXCEPT IN CONNECTION WITH OUR WORK. ALL RIGHTS OF DESIGN AND INVENTION ARE RESERVED. THIS IS AN ELECTRONICALLY GENERATED DOCUMENT - DO NOT SCALE THIS PRINT

PRP
DIST WP

OPPERMAN MASTERGEAR Ltd

Hambridge Lane, Newbury, Berkshire RG14 5TS England
Telephone: 01635 811500 Telefax: 01635 811501
E-Mail: sales@opperman-mastergear.co.uk

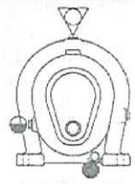
Operating Instructions No.258

TEMPO

QUILL TYPE

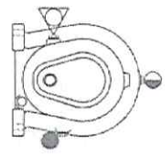
OIL LUBRICATED

SINGLE REDUCTION (Foot Motorised Units.)

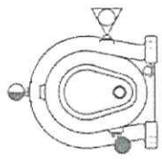


Standard Floor Mounting
Ref.B3

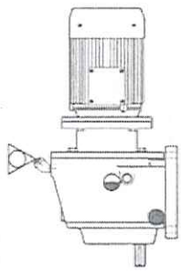
Ceiling Mounting
Ref.B8



Left Hand Wall Mounting
Ref.B6



Right Hand Wall Mounting
Ref.B7

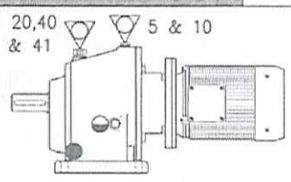


Final Shaft
Vertically Down
Foot Mounting
Ref.V5

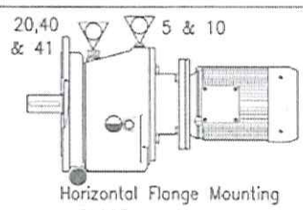
IMPORTANT: HEALTH AND SAFETY AT WORK

In the interest of Health and Safety at Work, it is essential that before installation such matters as the application, mounting position, maximum ratings, overhung loads and other similar matters should be thoroughly investigated. Technical details relating to Tempo Quill Type units are available from our Head Office at Newbury. In the event that any further advice is required please do not hesitate to contact us.

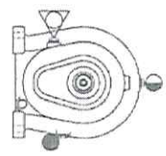
DOUBLE REDUCTION (Foot/Flange Motorised Units.)



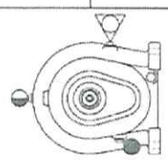
Standard Floor Mounting
Ref.B3



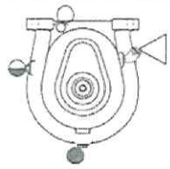
Horizontal Flange Mounting
Ref.B5



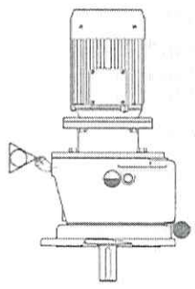
Left Hand Wall Mounting
Ref.B6



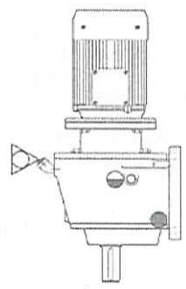
Right Hand Wall Mounting
Ref.B7



Ceiling Mounting
Ref.B8

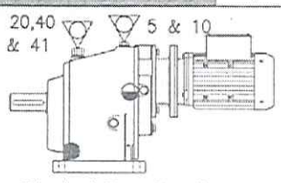


Final Shaft
Vertically Down
Flange Mounting
Ref.V1

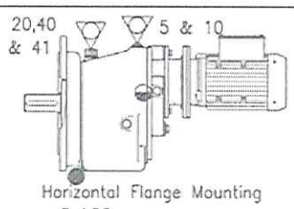


Final Shaft
Vertically Down
Foot Mounting
Ref.V5

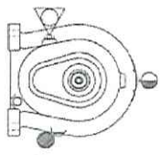
TRIPLE REDUCTION (Foot/Flange Motorised Units.)



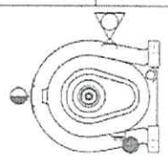
Standard Floor Mounting
Ref.B3



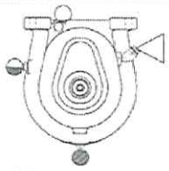
Horizontal Flange Mounting
Ref.B5



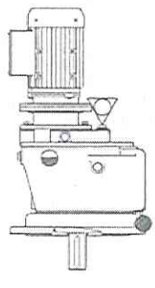
Left Hand Wall Mounting
Ref.B6



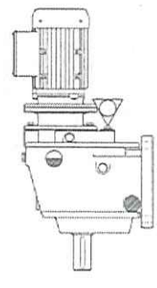
Right Hand Wall Mounting
Ref.B7



Ceiling Mounting
Ref.B8



Final Shaft
Vertically Down
Flange Mounting
Ref.V1



Final Shaft
Vertically Down
Foot Mounting
Ref.V5

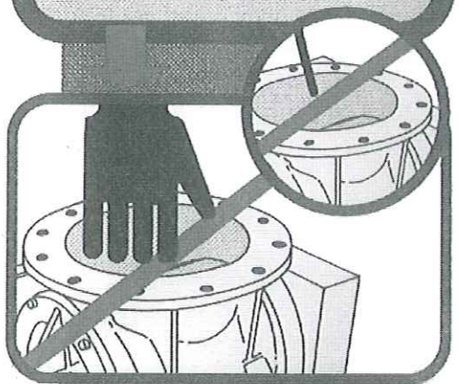
BREATHER ○ FILLER ▽ FILLER/BREATHER ▽ LEVEL ◒ DRAIN ● GREASE NIPPLE □

Carolina Conveying

NO

4

NEVER TOUCH VALVE INTERNALS WITH HANDS OR UNBLOCKING RODS.



ALWAYS ISOLATE POWER
DON'T TAKE RISKS.

STOP
READ

FOLLOW PROCEDURES ONE TO FOUR FULLY.

THEREBY PREVENTING DAMAGE TO:

- THE VALVE
- YOUR CLOTHING
- YOUR TOOLS
- BUT MOST IMPORTANT TO YOUR PERSONNEL.

TAKE CARE

Carolina Conveying

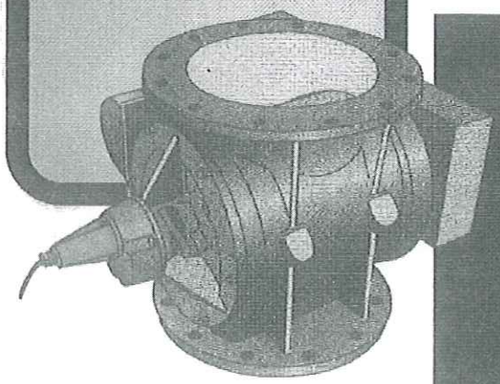
Carolina Conveying Inc.
P.O. Box 1208, Beaverdam Industrial Park
162 Great Oak Drive, Canton, NC 28716
Tel: (828) 235-1005 Fax: (828) 235-1006
www.carolinaconveying.com
email: sales@carolinaconveying.com

SAFETY 1ST

TAKE CARE

ROTARY AIRLOCKS ARE **HARMLESS** IF PROCEDURES ARE **FOLLOWED**

PLEASE READ



Carolina Conveying

Morse®

TORQUE LIMITER
INSTALLATION & MAINTENANCE
INSTRUCTIONS FOR 250A THRU 700A

Emerson Power Transmission
620 S. Aurora Street
ITHACA, NY 14850
Phone: 800-626-2093
www.emerson-ept.com

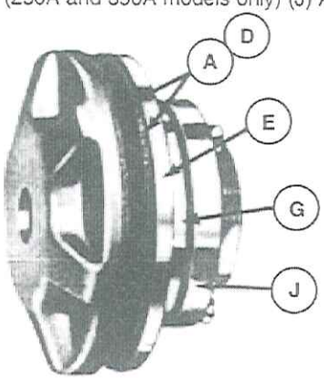
FORM
4446-004
Revised
February, 2003

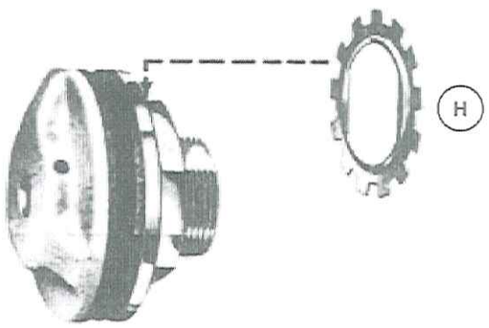
⚠WARNING

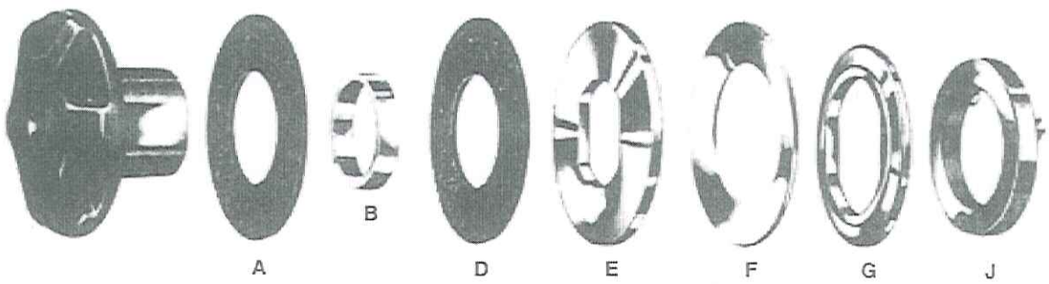
High voltage and rotating parts may cause serious or fatal injury.
Turn off power to install or service.
Operate with guards in place.
Read and follow all instructions.

1. **GENERAL**
Before assembly, the pressure plates, facings and center member (sprocket, sheave, plate, etc.) should be free of oil, grease, dirt and rust. The center member should have a 125 micro-inch finish in the bore and a 63 micro-inch finish on the area where the friction facings rub in order to obtain maximum rated capacity and optimum life from the Torque Limiter.

2. **ASSEMBLY**
Refer to the appropriate sketch (see below) and assemble on the torque limiter hub the following: (A) Friction facing (B) Bushing (C) Center member (not shown) (D) Friction facing (E) Pressure plate (F) Spring(s) (G) Pilot plate (500A and 700A models only) (H) Lockwasher (250A and 350A models only) (J) Adjusting nut.







3. **RUNNING-IN**

Torque Limiters should be run-in for the most consistent results. To run-in, adjust the Torque Limiter to 70-80% of the maximum single spring capacity and slip the center member approximately 60 RPM for approximately 4 minutes. (See steps 4 and 5 for setting and checking instructions.)

Torque Limiter Size	250A	350A	500A	700A
Run-In Torque–Lb. Ft.	14-16	38-44	108-125	290-330

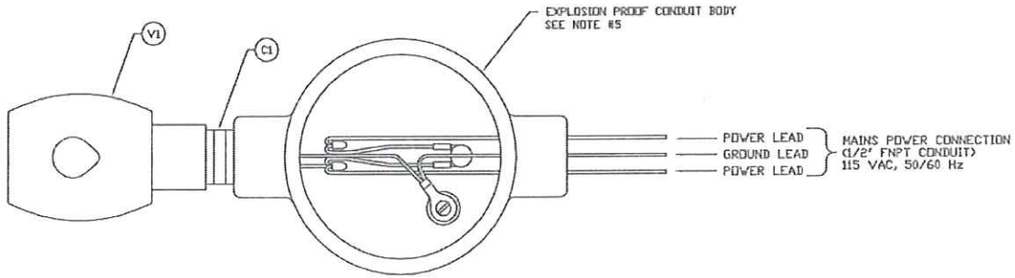
4. **TORQUE SETTING**

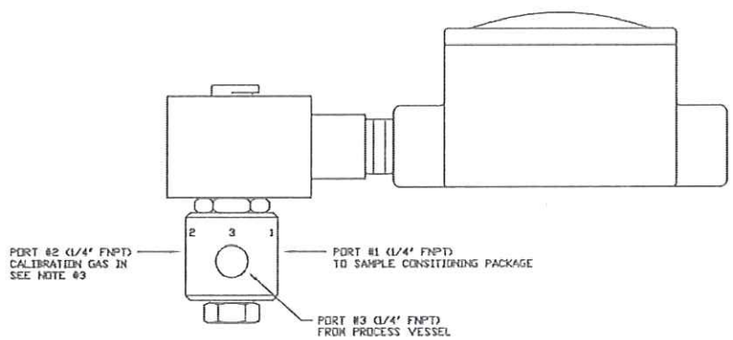
(A) For the 250A and 350A models: To adjust the Torque Limiter to carry the required torque, tighten the adjusting nut an appropriate amount. *Do not* completely flatten the disk spring. Check setting per step 5.

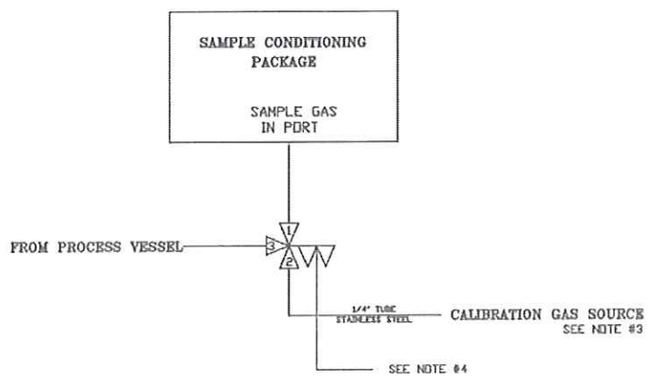
EMERSON.
Industrial Automation

© Emerson Power Transmission Manufacturing, L.P. or affiliates 1998-2003. All Rights Reserved.

REV.	E.C.O.	CHANGE DESCRIPTION	APP.	DATE
A	7141	ADDED 220 VAC VERSION	JJH	5/29/03
B	7595	SOLENOID AND CONBODY CHANGED	EJR	8/4/05
C	8040	ADDED GROUND CRIMP	JKS	12/6/06







NOTE:

1. REMOTE CALIBRATION SOLENOID IS TO BE INSTALLED IN THE SAMPLE LINE AND AS CLOSE TO THE SAMPLE PACKAGE AS POSSIBLE TO ACHIEVE THE QUICKEST REACTION TIME.
2. SOLENOID IS RATED FOR CLASS I DIVISION 1 AREAS, GROUPS A-D, WHEN INSTALLED WITH THE PROPER FITTINGS IN ACCORDANCE WITH ALL LOCAL AND NFPA ELECTRICAL CODES.
3. CALIBRATION IN PORT OF THE SOLENOID CAN BE LEFT OPEN IF AMBIENT AIR IS TO BE THE CALIBRATION GAS.
4. THE REMOTE CALIBRATION IS ENERGIZED AUTOMATICALLY BY THE OXYGEN ANALYZER WHEN THE ANALYZER IS IN CALIBRATION MODE.
5. THE EXPLOSION PROOF CONDUIT BODY CONTAINS ALL NECESSARY NOISE SUPRESSION DEVICES FACTORY INSTALLED.

4	3	2	1	ITEM	DRAWING No.	PART No.	DESCRIPTION
QTY PER ASSY				LIST OF MATERIALS			

STANDARD NOTES UNLESS OTHERVISE SPECIFIED

MACHINE DIAS. ON A COMMON CENTERLINE CONCENTRIC WITHIN .005 T.I.R.
THREADS: EXT.-CL2A, INT. CL2B
REMOVE BURRS AND SHARP EDGES .015R MAX.
NORMALITY SQUARENESS AND PARALLELISM OF MACHINED SURFACES .002 IN. PER IN. TO A MAX. OF .012 FOR SINGLE SURFACE
MACHINE CORNER RADII .010R
MACHINE FILLET RADII .010R
ALL MACHINED SURFACES 125

SIGNATURE		DATE
DRAWN BY:	JSH	9/17/97
CHECKED BY:	JSH	9/17/97
APVD. BY:	JSH	9/17/97

TOLERANCES
UNLESS OTHERVISE SPECIFIED
DECIMAL XX ± .01
DECIMAL .XXX ±.005
ANGLES ± 1°

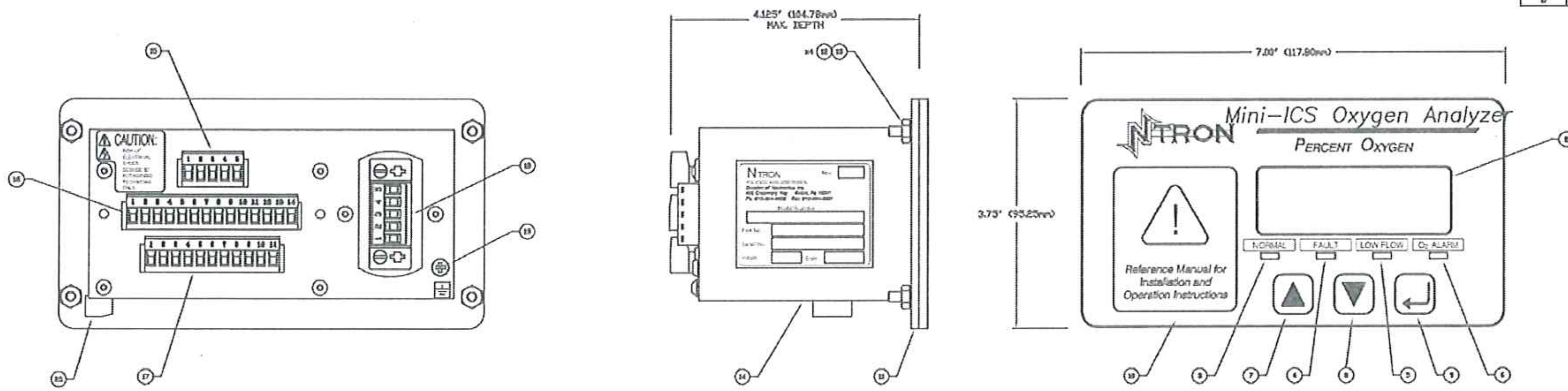
NTRON
A NEUTRONICS COMPANY
456 CREAMERY WAY
EXTON, PA 19341 U.S.A.
(610) 524-0808

TITLE
REMOTE CALIBRATION SOLENOID
VALVE INSTALLATION DRAWING

ACAD Vr: 13	DRAWING NO. SP-C-1202
REF: 6-02-4006-49-1	
SCALE: N/A	SHEET 1 OF 1

PRODUCT:

REV.	ECO	CHANGE DESCRIPTION	APP.	DATE
A	6915	INITIAL RELEASE	JDA	8/28/02
B	7180	ADDED REMOTE SWITCH TERMINAL OPTION		



DETAIL A: ANALYZER MODULE ASSEMBLY

1

TB1 TERMINAL PINOUT LISTING
DC-POWERED ANALYZER

PIN 1: CASE GROUND
PIN 2: DC COMMON
PIN 3: NO CONNECTION
PIN 4: DC POWER
PIN 5: NO CONNECTION

TB1 TERMINAL PINOUT LISTING
AC-POWERED ANALYZER

PIN 1: AC GROUND
PIN 2: NO CONNECTION
PIN 3: AC NEUTRAL
PIN 4: NO CONNECTION
PIN 5: AC HOT

TB2 TERMINAL PINOUT LISTING
ALL MODELS

PIN 1: REMOTE CALIBRATION VALVE, COMMON RELAY CONTACT
PIN 2: REMOTE CALIBRATION VALVE, NORMALLY OPEN RELAY CONTACT
PIN 3: FAULT ALARM, COMMON RELAY CONTACT
PIN 4: FAULT ALARM, NORMALLY OPEN RELAY CONTACT
PIN 5: OXYGEN ALARM, COMMON RELAY CONTACT
PIN 6: OXYGEN ALARM, NORMALLY CLOSED RELAY CONTACT
PIN 7: OXYGEN ALARM, NORMALLY OPEN RELAY CONTACT
PIN 8: INERT GAS CONTROL VALVE, COMMON RELAY CONTACT
PIN 9: INERT GAS CONTROL VALVE, NORMALLY CLOSED RELAY CONTACT
PIN 10: INERT GAS CONTROL VALVE, NORMALLY OPEN RELAY CONTACT
PIN 11: NO CONNECTION
PIN 12: NO CONNECTION
PIN 13: VOLTAGE RANGE OUTPUT, POSITIVE
PIN 14: VOLTAGE RANGE OUTPUT, NEGATIVE

TB3 TERMINAL PINOUT LISTING
ALL MODELS

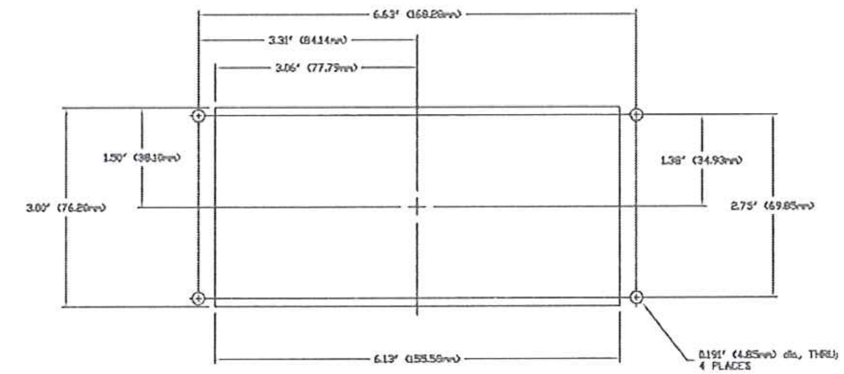
PIN 1: NO CONNECTION
PIN 2: NO CONNECTION
PIN 3: 12VDC BATTERY BACKUP, POSITIVE
PIN 4: 12VDC BATTERY BACKUP, NEGATIVE
PIN 5: OXYGEN CONCENTRATION VOLTAGE OUTPUT, POSITIVE
PIN 6: OXYGEN CONCENTRATION VOLTAGE OUTPUT, NEGATIVE
PIN 7: OXYGEN CONCENTRATION CURRENT OUTPUT, POSITIVE
PIN 8: OXYGEN CONCENTRATION CURRENT OUTPUT, NEGATIVE
PIN 9: RS-232 SERVICE PORT, TX
PIN 10: RS-232 SERVICE PORT, RX
PIN 11: RS-232 SERVICE PORT, RTN

TB4 TERMINAL PINOUT LISTING
ALL MODELS

PIN 1: OXYGEN SENSOR INPUT, POSITIVE
PIN 2: OXYGEN SENSOR INPUT, NEGATIVE
PIN 3: OXYGEN SENSOR INPUT, SHIELD
PIN 4: FLOW SWITCH INPUT, POSITIVE
PIN 5: FLOW SWITCH INPUT, NEGATIVE

ALTERNATE REMOTE SWITCH PINOUT LISTING

PIN 1: INCREASE, 5VDC
PIN 2: DECREASE, 5VDC
PIN 3: MODE, 5VDC
PIN 4: COMMON



DETAIL B: MOUNTING CUTOUT DIMENSIONS

NOTE:

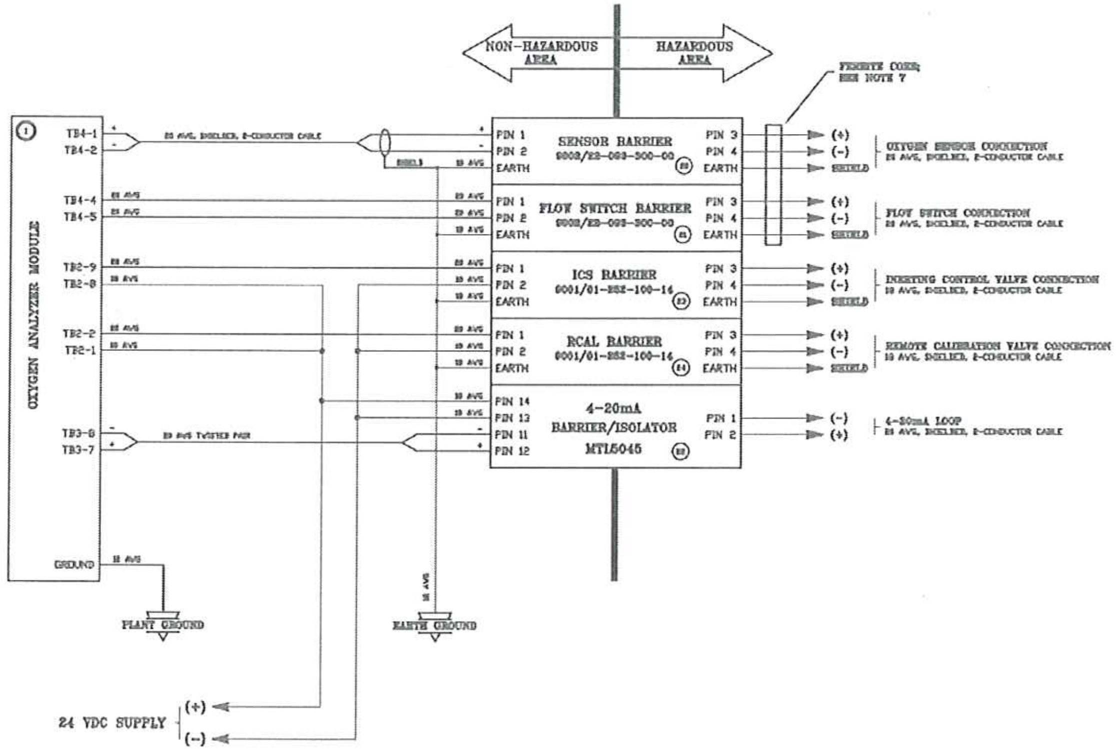
1. REFERENCE SYSTEM MANUAL BEFORE ATTEMPTING INSTALLATION, START-UP, OPERATION OR MAINTENANCE.
2. END USER BEARS FULL RESPONSIBILITY FOR MEETING ALL LOCAL CODES DURING INSTALLATION, START-UP, OPERATION AND MAINTENANCE OF SYSTEM.
3. MINI-ICS OEM ANALYZER MODULE IS SUITABLE FOR LOCATION ATMOSPHERES RATED AS NON-HAZARDOUS ONLY. WIRING OF ANALYZER INTO A HAZARDOUS-RATED ATMOSPHERE MUST BE MADE THROUGH BARRIER INTERFACE DEVICES SPECIFIED BY THIS DRAWING.
4. ANALYZER REQUIRES INTERFACE WITH AN OXYGEN SENSOR SYSTEM APPROVED FOR USE BY NEUTRONICS FOR PROPER SYSTEM FUNCTION.
5. BARRIER INTERFACE DEVICES MAY BE SUPPLIED BY END USER OR AS SEPARATE ITEMS BY NEUTRONICS. BARRIER INTERFACE DEVICES MUST MATCH TYPE AND MANUFACTURER OF THOSE SPECIFIED BY THIS DOCUMENT.
6. TYPICAL OXYGEN SENSOR TO BE UTILIZED WITH THE MINI-ICS ANALYZER WILL BE OF THE GALVANIC TYPE THAT WILL HAVE A FINITE LIFE AND WILL REQUIRE PERIODIC REPLACEMENT FOR PROPER SYSTEM FUNCTION.
7. ITEM NO. 25 WILL ONLY BE AVAILABLE WHEN SPECIFIED AT TIME OF SALE.
8. CUSTOMER TO REMOVE REMOTE SWITCH TERMINAL BLOCK FROM MODULE PRIOR TO INSERTION OF MODULE INTO CUSTOMER CUTOUT OR DAMAGE MAY OCCUR.

ITEM	REFERENCE	DESCRIPTION
25	---	REMOTE SWITCH TERMINAL (OPTIONAL)
24	STAHL 9002/01-252-100-14	REMOVE CALIBRATION VALVE PASSIVE BARRIER INTERFACE DEVICE
23	STAHL 9001/01-252-100-14	INERTING CONTROL VALVE PASSIVE BARRIER INTERFACE DEVICE
22	MTL 5045	4-20mA ACTIVE BARRIER INTERFACE DEVICE
21	STAHL 9002/22-093-300-00	FLOW SWITCH PASSIVE BARRIER INTERFACE DEVICE
20	STAHL 9002/22-093-300-00	OXYGEN SENSOR PASSIVE BARRIER INTERFACE DEVICE
19	---	ANALYZER CASE GROUND TERMINAL, #6-32 PAN HEAD SCREW & INTERNAL TOOTH WASHER
18	---	ANALYZER SENSOR INPUT TERMINAL, TB4
17	---	ANALYZER INTERFACE TERMINAL, TB3
16	---	ANALYZER INTERFACE TERMINAL, TB2
15	---	ANALYZER POWER TERMINAL, TB1
14	---	STEEL/ZINC PLATED, REAR ENCLOSURE
13	---	STAINLESS STEEL/NYLON INSERT, #8-32 LOCKING HEX NUT
12	---	STAINLESS STEEL, #8 INTERNAL TOOTH WASHER
11	---	NEOPRENE, FRONT PANEL GASKET
10	---	POLYESTER, FRONT DISPLAY LABEL
9	---	MODE SELECTION PUSH BUTTON SWITCH
8	---	DECREASE PUSH BUTTON SWITCH
7	---	INCREASE PUSH BUTTON SWITCH
6	---	OXYGEN ALARM STATUS LED, RED
5	---	LOW SAMPLE FLOW STATUS LED, RED
4	---	FAULT STATUS LED, YELLOW
3	---	NORMAL STATUS LED, GREEN
2	---	ANALYZER DIGITAL DISPLAY, 0.75" (19.05mm) LED
1	---	MINI-ICS OEM ANALYZER MODULE ASSEMBLY

LIST OF MATERIALS

SIGNATURE	DATE	
DRAWN BY: JDA	8/28/02	NTRON — A NEUTRONICS COMPANY
CHECKED BY: JDA	8/28/02	
APVD. BY: JDA	8/28/02	MINI-ICS OEM ANALYZER MODULE WITH STAHL BARRIER INTERFACE
ACAD Ver. 15		DRAWING NO. SP-E-1473
SCALE: FULL	SHEET 1 OF 2	

REV.	ECO	CHANGE DESCRIPTION	APP.	DATE
A	6915	INITIAL RELEASE	JDA	8/28/12
B	7180	ADDED REMOTE SWITCH TERMINAL OPTION		



DETAIL C: TYPICAL STAHL BARRIER INTERFACE WIRING DIAGRAM

ELECTRICAL WIRING NOTES:

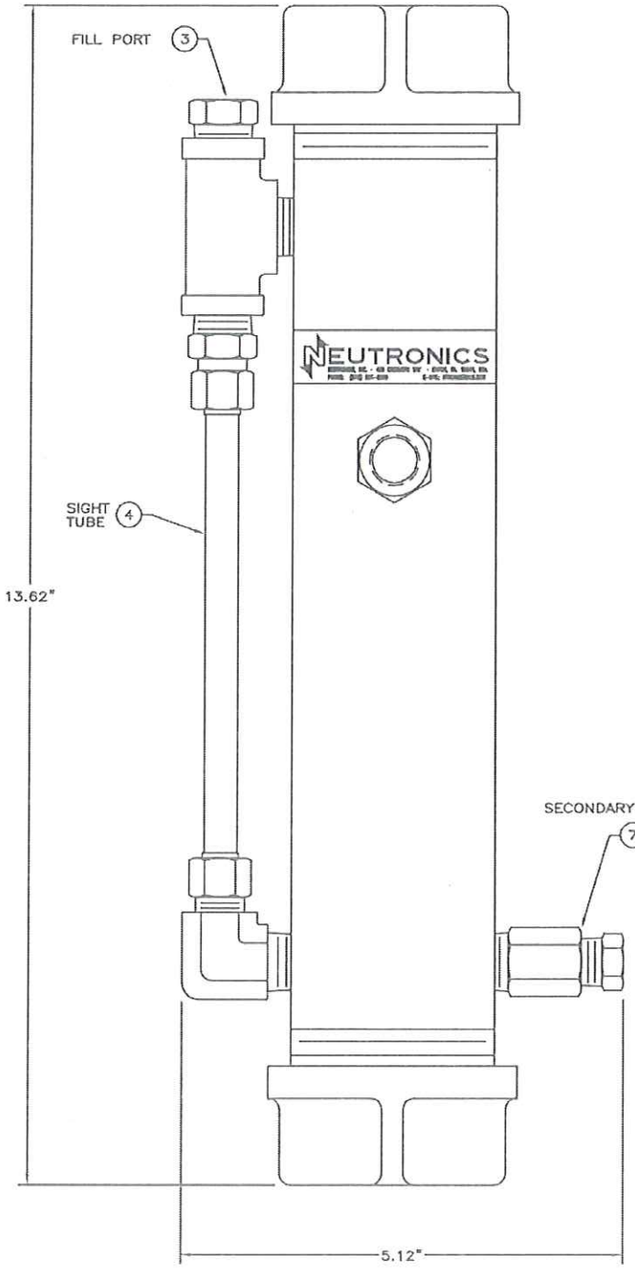
1. ALL ANALYZER PINOUT LISTINGS ARE PROVIDED ON SHEET 1 OF THIS DOCUMENT.
2. ANALYZER WILL BE SUPPLIED AS EITHER AC OR DC POWERED ACCORDING TO CUSTOMER SPECIFICATIONS.
3. INSTALLATION OF WIRING TO BARRIER INTERFACE DEVICES MUST ADHERE TO LOCAL CODES FOR HAZARDOUS AREA WIRING.
4. BARRIER INTERFACE DEVICE PRESENCE MAY VARY ACCORDING TO CUSTOMER APPLICATION.
5. 4-20mA LOOOP LOAD SPECIFICATIONS:
   4-20mA DIRECTLY FROM ANALYZER TB3 TERMINAL: 300 ohms (SIGNAL NON-ISOLATED)
   4-20mA FROM INTERFACE BARRIER: 800 OHMS (SIGNAL ISOLATED)
6. RELAY CONTACT RATINGS:
   VDE CONTACT RATINGS: 8 AMPS, 250 VAC
   UL/CSA CONTACT RATINGS: 10 AMPS, 240 VAC
   8 AMPS, 24 VDC
   1/3 HP, 120 VAC
   1/2 HP, 240 VAC
7. OXYGEN SENSOR AND FLOW SWITCH WIRING FROM THE FIELD SHALL BE LOOPED THROUGH A FERRITE CORE, SUPPLIED WITH THE ANALYZER, TO MINIMIZE EMI/RFI ISSUES.
8. CONNECTION TO EARTH GROUND SHALL BE MADE FROM EARTH GROUND TERMINAL OF BARRIER DEVICES TO LOCAL EARTH GROUND BY LESS THAN ONE (1) OHM RESISTANCE.

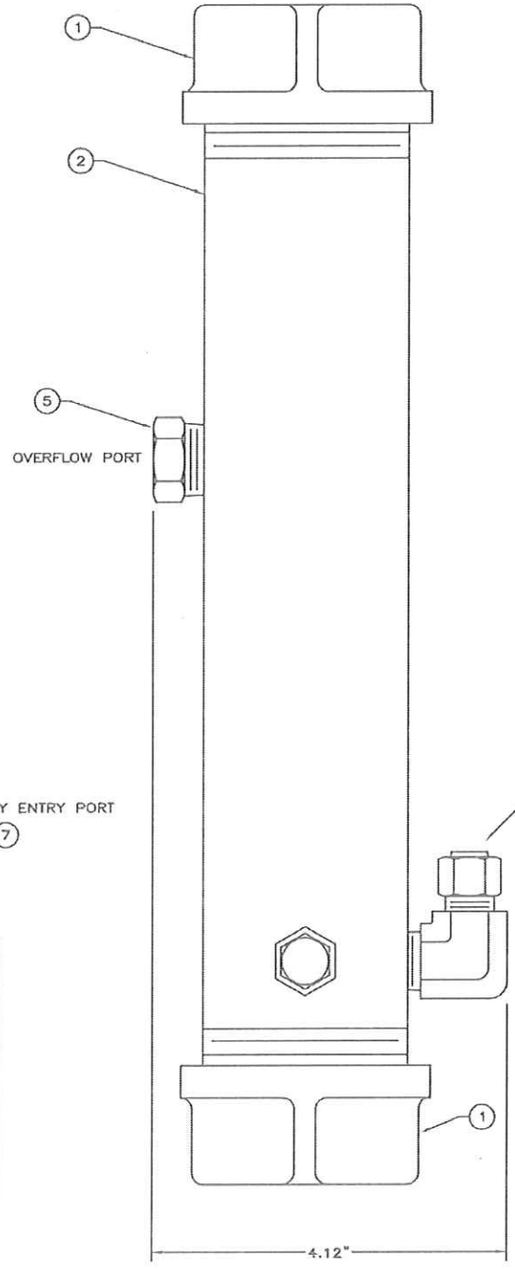
ITEM	REFERENCE	DESCRIPTION
25	---	REMOTE SWITCH TERMINAL (OPTIONAL)
24	STAHL 9001/01-252-100-14	REMOVE CALIBRATION VALVE PASSIVE BARRIER INTERFACE DEVICE
23	STAHL 9001/01-252-100-14	INERTING CONTROL VALVE PASSIVE BARRIER INTERFACE DEVICE
22	MTL 5045	4-20mA ACTIVE BARRIER INTERFACE DEVICE
21	STAHL 9002/22-093-300-00	FLOW SWITCH PASSIVE BARRIER INTERFACE DEVICE
20	STAHL 9002/22-093-300-00	OXYGEN SENSOR PASSIVE BARRIER INTERFACE DEVICE
19	---	ANALYZER CASE GROUND TERMINAL, #6-32 PAN HEAD SCREW & INTERNAL TOOTH WASHER
18	---	ANALYZER SENSOR INPUT TERMINAL, TB4
17	---	ANALYZER INTERFACE TERMINAL, TB3
16	---	ANALYZER INTERFACE TERMINAL, TB2
15	---	ANALYZER POWER TERMINAL, TB1
14	---	STEEL/ZINC PLATED, REAR ENCLOSURE
13	---	STAINLESS STEEL/NYLON INSERT, #8-32 LOCKING HEX NUT
12	---	STAINLESS STEEL, #8 INTERNAL TOOTH WASHER
11	---	NEOPRENE, FRONT PANEL GASKET
10	---	POLYESTER, FRONT DISPLAY LABEL
9	---	MODE SELECTION PUSH BUTTON SWITCH
8	---	DECREASE PUSH BUTTON SWITCH
7	---	INCREASE PUSH BUTTON SWITCH
6	---	OXYGEN ALARM STATUS LED, RED
5	---	LOW SAMPLE FLOW STATUS LED, RED
4	---	FAULT STATUS LED, YELLOW
3	---	NORMAL STATUS LED, GREEN
2	---	ANALYZER DIGITAL DISPLAY, 0.75' (19.05mm) LED
1	---	MINI-ICS OEM ANALYZER MODULE ASSEMBLY

LIST OF MATERIALS

STANDARD NOTES UNLESS OTHERWISE SPECIFIED	SIGNATURE	DATE	
MACHINE DIAS. ON A COMMON CENTERLINE CONCENTRIC WITHIN .005 TIR.	DRAWN BY: JDA	8/28/12	N-TRON A NEUTRONICS COMPANY
THREADS: EXT. CLASS 2A, INT. CLASS 2B	CHECKED BY: JDA	8/28/12	
REMOVE BURRS AND SHARP EDGES .005R MAX.	APVD. BY: JDA	8/28/12	MINI-ICS OEM ANALYZER MODULE WITH STAHL BARRIER INTERFACE
NORMALITY SQUARENESS AND PARALLELISM OF MACHINED SURFACES ARE .001 PER IN. TO A MAX. OF .003 FOR SINGLE SURFACE	TOLERANCES UNLESS OTHERWISE SPECIFIED		ACAD Ver. 13 / DRAWING NO. SP-E-1473
MACHINE CORNER RADII .005R; MACHINE FILLET RADII .005R; SUPPLY PART CLEAN, FREE OF OILS, DIRT, ETC. ALL MACHINED SURFACES	DECIMAL .XX ± .01; DECIMAL .XXX ± .005; ANGLES ± 1°		SCALE: FULL / SHEET 2 OF 2 / PRODUCT: MINI-ICS OEM

REV.	ECO	CHANGE DESCRIPTION	APP.	DATE





LIST OF MATERIALS

ITEM	DESCRIPTION
1	END CAP
2	HOUSING SHELL
3	FILL PORT, 3/8 NPT, PLUGGED
4	SIGHT TUBE, TEFLON
5	OVERFLOW PORT, 3/8 NPT
6	ENTRY PORT, 3/8 TUBE
7	ENTRY PORT #2, 3/8 NPT

SIGNATURE	DATE
DRAWN BY: EJR	5/10/02
CHECKED BY:	
APVD. BY:	

TOLERANCES
UNLESS OTHERWISE SPECIFIED
DECIMAL .XX ± .01

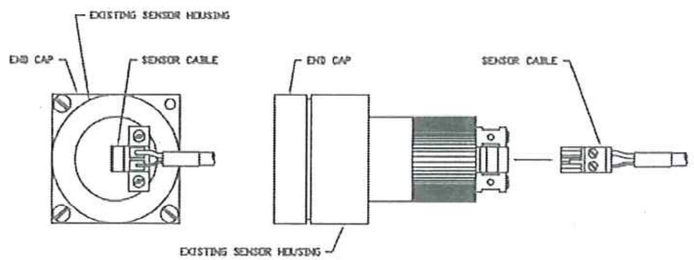
NTRON — A NEUTRONICS COMPANY
456 CREAMERY WAY
EXTON, PA 19341 U.S.A.
(610) 524-8808

TITLE: STAINLESS STEEL NEGATIVE PRESSURE AUTOMATIC DRAIN

ACAD Vr: 13

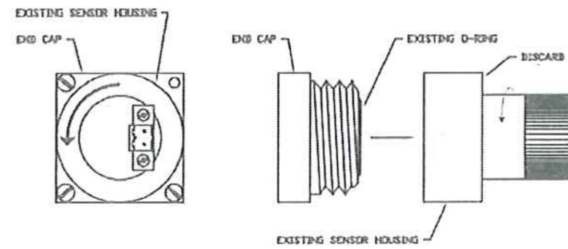
DRAWING NO. SP-C-1456

SCALE: FULL | SHEET 1 OF 1 | PRODUCT:



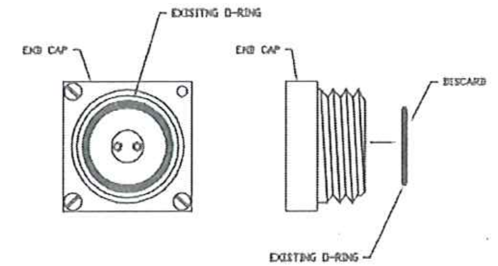
STEP 1:

REMOVE SENSOR CABLE FROM THE EXISTING SENSOR HOUSING.
CABLE IS REMOVED BY PULLING STRAIGHT BACK AS DEPICTED.



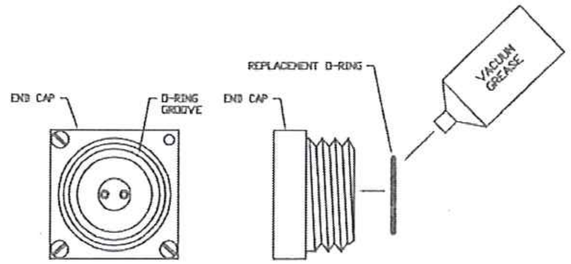
STEP 2:

REMOVE THE EXISTING SENSOR HOUSING BY UNSCREWING IN A
COUNTER CLOCKWISE ROTATION AS DEPICTED. DISCARD EXISTING SENSOR HOUSING.



STEP 3:

REMOVE AND DISCARD THE EXISTING O-RING FROM THE END CAP.
NOTE THAT THE EXISTING O-RING MAY BE STUCK INSIDE OF THE EXISTING SENSOR HOUSING.

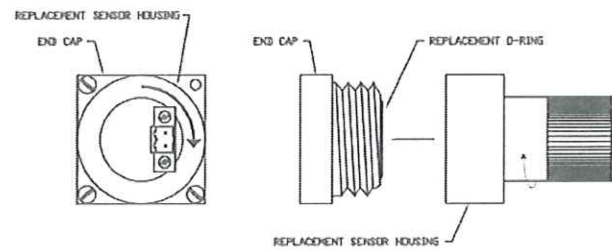


STEP 4:

LIGHTLY GREASE THE REPLACEMENT O-RING AND INSTALL INTO THE O-RING GROOVE OF THE END CAP
AS DEPICTED. RECOMMEND THE USE OF DOW CORNING SILICON HIGH VACUUM GREASE.

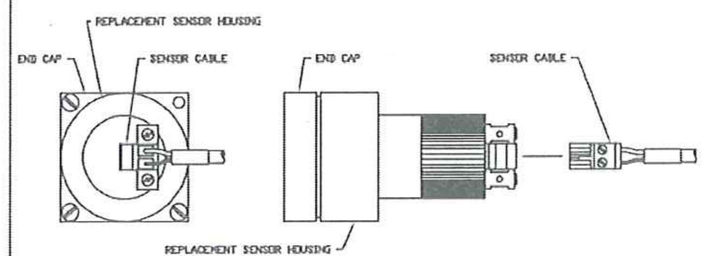
NOTE:

VACUUM GREASE IS AVAILIBLE AS SPARE PART NUMBER 5-07-1000-19-0.



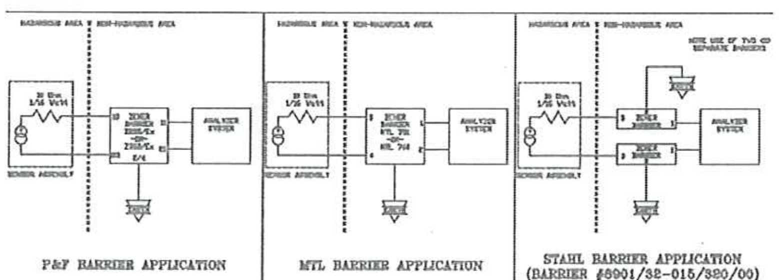
STEP 5:

INSTALL THE REPLACEMENT SENSOR HOUSING ONTO THE END CAP BY THREADING IN A
CLOCKWISE ROTATION AS DEPICTED. INSURE THAT FULL O-RING COMPRESSION IS ACHIEVED
BY FULLY TIGHTENING SENSOR HOUSING.



STEP 6:

CONNECT THE SENSOR CABLE TO THE SENSOR HOUSING CONNECTOR BY
PRESSING STRAIGHT IN AS DEPICTED. SENSOR CABLE WILL ONLY CONNECT
IN ONE POSITION TO GUARD AGAINST CONNECTION ERROR.



NOTE

1. OXYGEN SENSOR MODEL(S) C/S, PP/S, C/H, AND CP/L HAVE BEEN INVESTIGATED BY CSA FOR ELECTRICAL SAFETY FEATURES ONLY AND NOT FOR DETECTING OXYGEN.
2. OXYGEN SENSOR MODEL(S) C/S, PP/S, C/H, AND CP/L IS CERTIFIED AS COMPONENT FOR INSTALLATION IN ENCLOSURE WHERE THE SUITABILITY OF THE FINAL COMBINATION IS SUBJECT TO ACCEPTANCE OF THE LOCAL AUTHORITY HAVING JURISDICTION.

ELECTRICAL CONNECTION SCHEMATIC

NOTE:

1. **SENSOR HANDLING:**
   DO NOT EXPOSE OPEN END OF SENSOR HOUSING TO LIQUIDS, PARTICULATE, GREASE, ETC.
   DO NOT TOUCH TOP OF SENSOR LOCATED IN OPEN END OF SENSOR HOUSING
   DO NOT ALLOW O-RING VACUUM GREASE TO COAT TOP OF SENSOR IN OPEN END OF SENSOR HOUSING
   DO NOT EXPOSE SENSOR HOUSING TO SUDDEN IMPACT, MECHANICAL SHOCK, OR ELECTRICAL SHOCK
   DO NOT EXPOSE SENSOR HOUSING TO TEMPERATURE EXTREMES FOR ANY EXTENDED PERIOD OF TIME (BELOW 32°F, ABOVE 90°F)
2. INSURE THAT REPLACEMENT O-RING IS PROPERLY SEATED INTO THE END CAP GROOVE BEFORE INSTALLING REPLACEMENT SENSOR HOUSING.
3. EXISTING SENSOR HOUSING AND O-RING SHOULD BE IMMEDIATELY DISCARDED TO GUARD AGAINST ERRANT RE-USE. O-RING IS ALWAYS TO BE REPLACED WHEN REPLACING SENSOR HOUSING.
4. OXYGEN SENSOR MODEL(S) C/S, PP/S, C/H, AND CP/L HAVE BEEN INVESTIGATED BY CSA FOR ELECTRICAL SAFETY FEATURES ONLY AND NOT FOR DETECTING OXYGEN.
5. SENSOR IS SUITABLE FOR USE IN AREAS CLASSIFIED AS HAZARDOUS (CLASS I, DIVISION 1, GROUPS A, B, C, AND D) WHEN PROPERLY INTERFACED WITH A BARRIER DEVICE AS REFERENCED BY THE ELECTRICAL CONNECTION SCHEMATIC.

B	11/16/89	—	CSA FINAL APPROVAL	J.A.A.	11/16/89
A	10/26/89	—	CSA APPROVAL REVISIONS	J.A.A.	10/26/89
REV	DATE	ECO #	CHANGE DESCRIPTION	APP. INT.	APP. DATE

SENSOR REPLACEMENT DETAIL
STANDARDIZED SENSOR ASSEMBLIES

SCALE N/A | DATE 3/18/89 | J.D.ANDERSON | DRAWN BY JDA

CSA FILE REFERENCE: LR 83071-2

NEUTRONICS INC. | SP-E-0504 | REV B

ITEM	PART NUMBER	DESCRIPTION	QTY.
1	2-02-3300-02-0	FILTER HEAD , 316 SS	1
2	4-04-4060-07-0	FILTER HEAD O-RING, VITON.	1
2A	4-04-4060-07-2	FILTER HEAD O-RING, EPDM	1
3	2-02-3000-45-0	THREADED ROD, 316 SS	1
4	4-05-2700-02-0	FILTER ELEMENT	1
5	2-02-3000-48-0	GUIDE NUT , 316 SS	1
6	3-01-1101-00-0	BRACKET SCREWS , 316 SS	2
7	2-02-3300-03-0	FILTER BOWL , 316 SS	1
8	4-03-3306-04-0	3/8P HEX PLUG , 316 SS	1
9	3-03-3102-00-0	LOCKWASHERS , 316 SS	2
10	4-03-3304-24-1	HEX ADAPTOR , 316 SS	1
11	2-02-3300-02-2	BOWL LOCK NUT , 316 SS	1
12	4-04-4000-44-0	BOWL LOCK NUT O-RING, VITON.	1
12A	4-04-4000-44-2	BOWL LOCK NUT O-RING, EPDM	1
13	2-02-1000-02-0	MOUNTING BRACKET, 316 SS	1

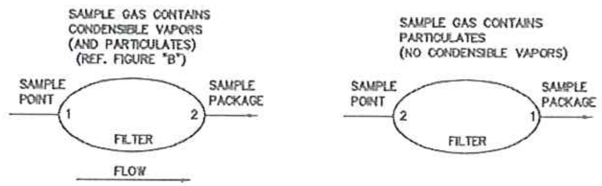


FIGURE "A"

FLOW DIAGRAM

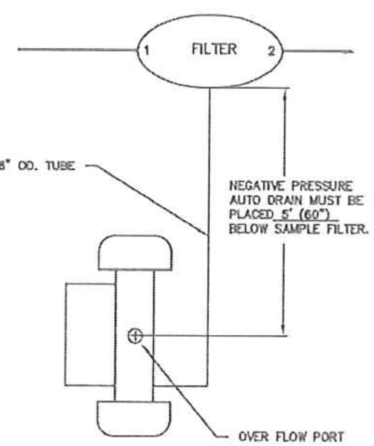
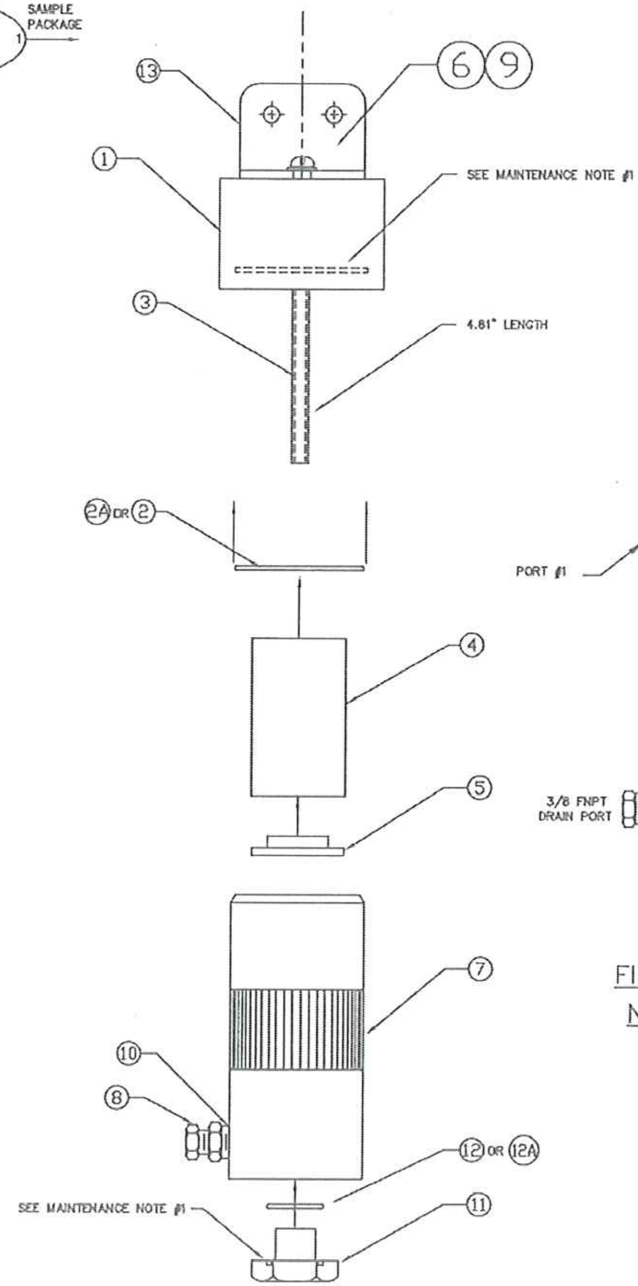
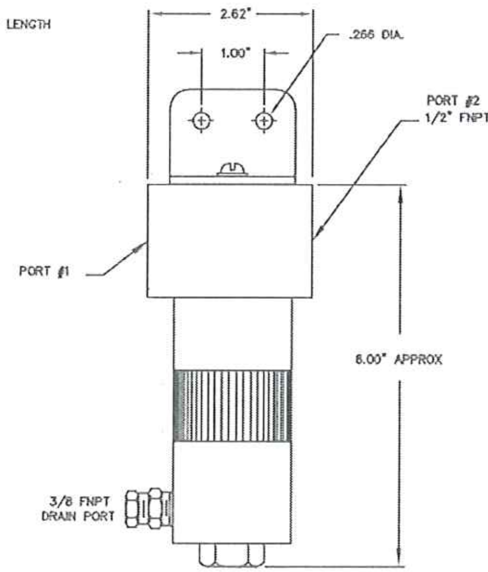


FIGURE "B"

AUTO DRAIN INSTALLATION





FINAL ASSEMBLY

NOT TO SCALE

MAINTENANCE NOTES:

1. O-RING MUST SEAT INSIDE FILTER HEAD RECESS O-RING GROOVE. APPLY VACUUM GREASE TO O-RING BEFORE INSTALLATION.
2. FILTER IS SHIPPED WITH ITEM #8 INSTALLED, DRAIN PLUG. AN ELBOW IS PROVIDED SHIPPED LOOSE, TO BE INSTALLED IN PLACE OF ITEM #8 WHEN THE FILTER TO BE USED WITH AN AUTO DRAIN. SEE FIGURE B. MALE ELBOW, 3/8P-3/8T (#4-03-3203-04-0) IN PLACE OF ITEM #8 FOR USE WITH AN AUTO DRAIN.
3. WILL HAVE PLUG IN DRAIN PORT.

INSTALLATION NOTES:

1. MOUNT FILTER IN VERTICAL AND UPRIGHT POSITION AS SHOWN.
2. REFERENCE FIGURE "A" FOR INPUT/OUTPUT PORT CONFIGURATION.

SPARE PARTS: 6-02-4000-22-0

FILTER ELEMENT 4-05-2700-02-0

FILTER HEAD O-RING (VITON) 4-04-4060-07-0

FILTER BOWL LOCK NUT O-RING (VITON) 4-04-4000-44-0

SPARE PARTS: 6-02-4000-22-9

FILTER ELEMENT 4-05-2700-02-0

FILTER HEAD O-RING (EPDM) 4-04-4060-07-2

FILTER BOWL LOCK NUT O-RING (EPDM) 4-04-4000-44-2

MODEL 33 DETAIL
FILTER INSTALLATION

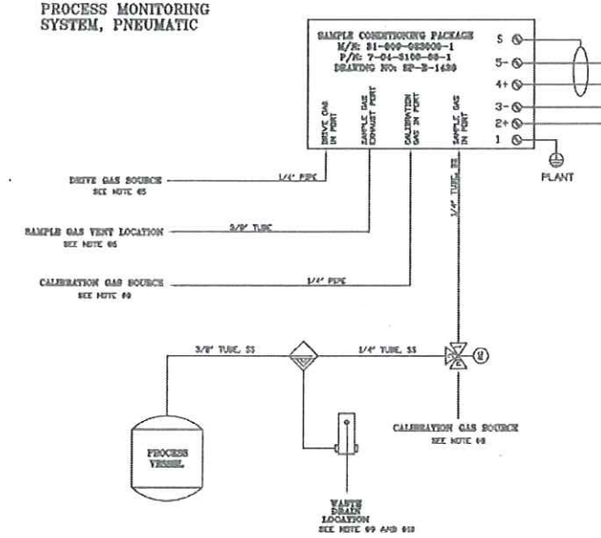
SCALE N/A
DATE 2/26/91 RICHARD J. NYCE
JOB NO. 33 FILTER

NITRON A NEUTRONICS COMPANY

SP-E-0765

REV.	E.C.O.	CHANGE DESCRIPTION	APP.	DATE
A	-----	INITIAL RELEASE	JKS	3/6/07

PROCESS MONITORING SYSTEM, PNEUMATIC



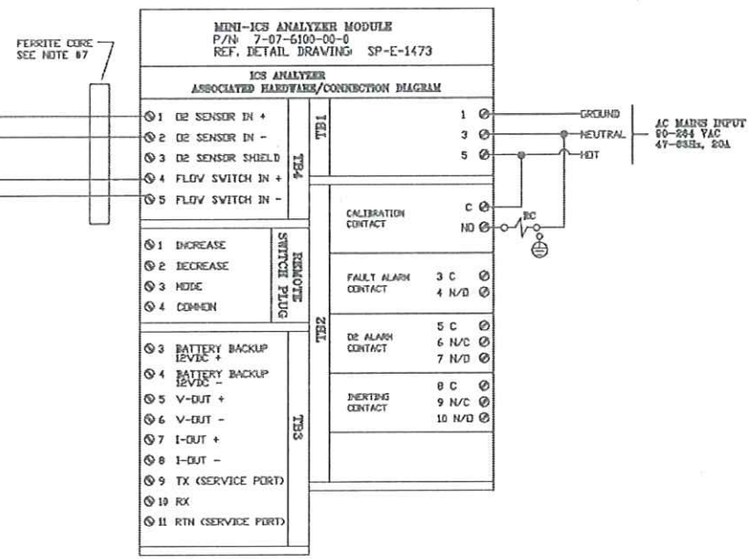
PNEUMATIC NOTES:

1. REFERENCE SYSTEM MANUAL BEFORE ATTEMPTING INSTALLATION, START UP, OPERATION, OR MAINTENANCE, TO AVOID LOSS OF SYSTEM WARRANTY.
2. ALL COMPONENTS SUITABLE FOR LOCATION IN HAZARDOUS CLASS I, GROUP C & D AREAS
3. CUSTOMER IS RESPONSIBLE FOR MEETING ALL LOCAL CODES.
4. ALL SAMPLE LINES SHALL SLOPE DOWN TOWARDS PROCESS OR DOWN TOWARDS PREFILTERS. SAMPLE LINES SHALL BE MADE WITH NO LOOPS, SAGS, LOW SPOTS, OR OTHER FEATURES WHICH MAY PROMOTE LIQUID ACCUMULATION
5. DRIVE GAS SOURCE SHALL BE CLEAN, DRY, OIL FREE, INSTRUMENT QUALITY COMPRESSED AIR OR INERT GAS AT 40-100 PSIG, MINIMUM 2 CFM.
6. CONNECTION OF SAMPLE GAS EXHAUST TO VENT LOCATION SHALL BE MADE WITH NO LOOPS, SAGS, LOW SPOTS, OR OTHER FEATURES WHICH MAY PROMOTE LIQUID ACCUMULATION. VENT LOCATION PLUMBING SHALL NOT EXERT BACK PRESSURE ON SAMPLE PACKAGE IN EXCESS OF 1 PSIG.
7. VORTEX GAS EXHAUST WILL CONSIST OF DRIVE GAS ONLY. IT IS NOT RECOMMENDED TO PLUMB TO THIS PORT. IF PLUMBING IS INSTALLED, IT SHALL NOT EXERT BACK PRESSURE ON SAMPLING PACKAGE IN EXCESS OF 1 PSIG.
8. CALIBRATION GAS SOURCE TO BE CLEAN, DRY, AMBIENT AIR KNOWN TO BE 20.9% OXYGEN. NO PLUMBING OF THE GAS SOURCE TO SAMPLING IS REQUIRED IF AMBIENT AIR IS UTILIZED. SPECIALTY GASSES MAY ALSO BE EMPLOYED AS CALIBRATION GAS. ALWAYS SPECIFY A NITROGEN BACKGROUND WHEN ORDERING A SPECIALTY GAS. BE USED AS A MANUAL BACKUP FOR THE REMOTE CALIBRATION SOLENOID VALVE.
9. PREFILTER DRAIN WILL EXPELL CONDENSED PROCESS LIQUIDS. CONNECT DRAIN TO A SUITABLE, ENVIRONMENTALLY SAFE LOCATION.
10. AUTOMATIC DRAIN MUST BE LOCATED A MINIMUM OF 60 INCHES BELOW THE PREFILTER.

PNEUMATIC INSTALLATION

PNEUMATIC SYMBOL KEY			
SYMBOL	PART NUMBER	REFERENCE DOCUMENT	DESCRIPTION
	6-02-4000-40-1	SP-C-1202	REMOTE CALIBRATION GAS SOLENOID VALVE, 110 VAC
	6-02-1000-44-0	SP-C-1458	REG.PRESSURE AUTODRAIN, SS
	6-02-4000-02-0	SP-E-0765	SAMPLE PREFILTER, SS/YT

PROCESS MONITORING SYSTEM, ELECTRICAL



ELECTRICAL INSTALLATION

ELECTRICAL NOTES:

1. REFERENCE SYSTEM MANUAL BEFORE ATTEMPTING INSTALLATION, START UP, OPERATION, OR MAINTENANCE, TO AVOID LOSS OF SYSTEM WARRANTY.
2. TYPICAL MINI-ICS SYSTEM IS SUITABLE FOR MOUNTING IN AREA ATMOSPHERES CLASSIFIED AS NON HAZARDOUS ONLY.
3. CUSTOMER IS RESPONSIBLE FOR MEETING ALL LOCAL CODES.
4. CUSTOMER TO CONNECT ANALYZER PACKAGE EARTH GROUND TO LOCAL EARTH GROUND BY LESS THAN ONE OHM RESISTANCE.
5. CUSTOMER IS RESPONSIBLE FOR PROVIDING & PUTTING THE APPROPRIATE SEAL FITTINGS FOR SOLENOID VALVES AND ELECTRICAL CONNECTIONS.
6. ALL AC WIRING TO BE 18 AWG MINIMUM. ALL SIGNAL WIRING SHALL BE 2 CONDUCTOR SHIELDED CABLE, 20 AWG OR 2 CONDUCTOR SHIELDED/TWISTED PAIR, 20 AWG.
7. OXYGEN SENSOR AND FLOW SWITCH WIRING FROM THE FIELD SHALL BE LOOPED THROUGH A FERRITE CORE, SUPPLIED WITH THE ANALYZER TO MINIMIZE EMI/RFI ISSUES.

SIGNATURE		DATE
DRAWN BY:	JKS	3/1/07
CHECKED BY:	VBC	3/6/07
APVD BY:	JKS	3/6/07

NTRON — A NEUTRONICS COMPANY
456 CREAMERY WAY
EXTON, PA 19341 U.S.A.
(610) 524-0900

TITLE: OXYGEN MONITORING SYSTEM INSTALLATION SCHEMATICS

ACAD Ver: 13
PROJECT:
DRAWING NO. FI-C-0238
SCALE: N/A
SHEET 1 OF 1

Neutronics.
456 Creamery Way
Exton, PA 19341

MANUAL ADDENDUM FOR MINI-ICS (SENSOR)

The recommended sensor for the Model Mini-ICS is part number 8-01-1000-02-3. It has an internal load resistor that produces a milivolt signal necessary for the analyzer's operation. It also creates a failsafe mechanism that triggers a fault warning on the analyzer should the sensor harness become disconnected. It is still possible to use any remaining 8-01-1000-02-2 in stock, however, the included 47.5 Ohm, 1/8W, 1% resistor must be installed across the sensor terminals (Pin Numbers 1 & 2 on TB4) for proper operation.

REMOVE THE RESISTOR IF THE SENSOR IS CHANGED TO THE NEW 8-01-1000-02-3 PART NUMBER AS THE ANALYZER WILL NOT WORK PROPERLY WITH BOTH COMPONENTS.

CAUTION:
THE ATTACHED MANUAL AND DRAWINGS MUST BE READ AND UNDERSTOOD FULLY PRIOR TO INSTALLATION AND START-UP OF THE SYSTEM.

NEUTRONICS INC.
•Automotive Division •Biomarine Inc. •Ntron Division
456 Creamery Way Exton, PA USA 19341-2532
(Phone) 610-524-8800 (Fax) 610-524-8807

MINI-ICS ANALYZER CUSTOMER CONFIGURATION SHEET-MCWS055

CUSTOMER INFORMATION

CUSTOMER NAME:	Wyssmont
STREET ADDRESS:	1407 Bergen Boulevard
CITY:	Fort Lee
STATE:	NJ
POSTAL CODE:	07024
COUNTRY:	
CONTACT NAME:	
TELEPHONE NUMBER:	
EXTENSION:	
FAX NUMBER:	
EMAIL ADDRESS:	

DATE:	SALES ORDER:	SHIP VIA:	DELIVERY DATE:	TERMS:
1/24/07	29258		3/30/07	

CUSTOMER CONFIGURATION INFORMATION

1. SUPPLY VOLTAGE (SELECT ONE)

90 – 250 VAC, 50-60HZ	X
12-36 VDC	

2. SENSOR TYPE (SELECT ONE) – See Additional Requirements

GP SENSOR (PART NO: 8-01-1000-02-3)	
CAG-250 NYLON BODY (PART NO: C1-16-1000-01-1)	
IT (CR) SENSOR (PART NO: 6-01-1001-91-0)	
GP Sensor w/ External 47 Ohm Resistor (Part NO: 8-01-1000-02-2)	X

3. SAFETY BARRIER TYPE (SELECT ONE)

MTL (PASSIVE)	
STAHL (PASSIVE)	X
PEPPERL & FUCHS (ACTIVE)	
NONE	

CERTIFICATE OF ANALYSIS
Mini-ICS Analyzer System
Neutronics Incorporated
456 Creamery Way * Exton, PA 19341 USA
Phone: (610) 524-8800 FAX: (610) 524-8807

FINAL SYSTEM IDENTIFICATION

Analyzer Model Number: AC Mini-ICS Mod.
Analyzer Part Number: 7-07-6100-00-0 Revision Level: D
Analyzer Serial Number: 29258
Sample System Model Number: 31-609-023000-1
Sample System Part Number: 7-04-3100-65-1 Revision Level: A
Analyzer Sales Order: 29258

GENERIC ANALYZER

Generic Analyzer Part Number: 8-01-1001-31-0 Revision Level: B
Generic Analyzer Work Order: A25-86
Software Version: 4003

FINAL SYSTEM CONFIGURATION (MP-0398)

Analyzer Power: 90-250 Volts (AC) DC
Oxygen Sensor Type: (GP) MAX-250E MAX-250EN CR Cal Error Limit: 30
Barrier Type: MTL(passive) (Stahl (passive)) P&F(active) none
NOTE: Active barrier disables sensor disconnect.
Fault & O2 Alarm Relay Action: (Failsafe) Non-Failsafe
O2 Alarm Relay: (Ascending) Descending
O2 Alarm Trigger Level: 8 % Oxygen
High ICS Trigger Level: 7 % Oxygen
Low ICS Trigger Level: 6 % Oxygen
Low Sensor Trigger Level: .5 % Oxygen
Inert on Flow Fault: (Yes) No
Inert on Sensor Disconnect: (Yes) No
Inert on A2D Fault: (Yes) No
Inert on Low Sensor: (Yes) No
Manual Analog Output Voltage Concentration: Zero: N/A % Full Scale N/A %
Manual Analog Output Current Concentration: Zero: N/A % Full Scale N/A %
☞ Default 0-25%

Tested by: 0214	Quality Assurance accepted by: AB
Date 3-15-07	Date: 3/29/07

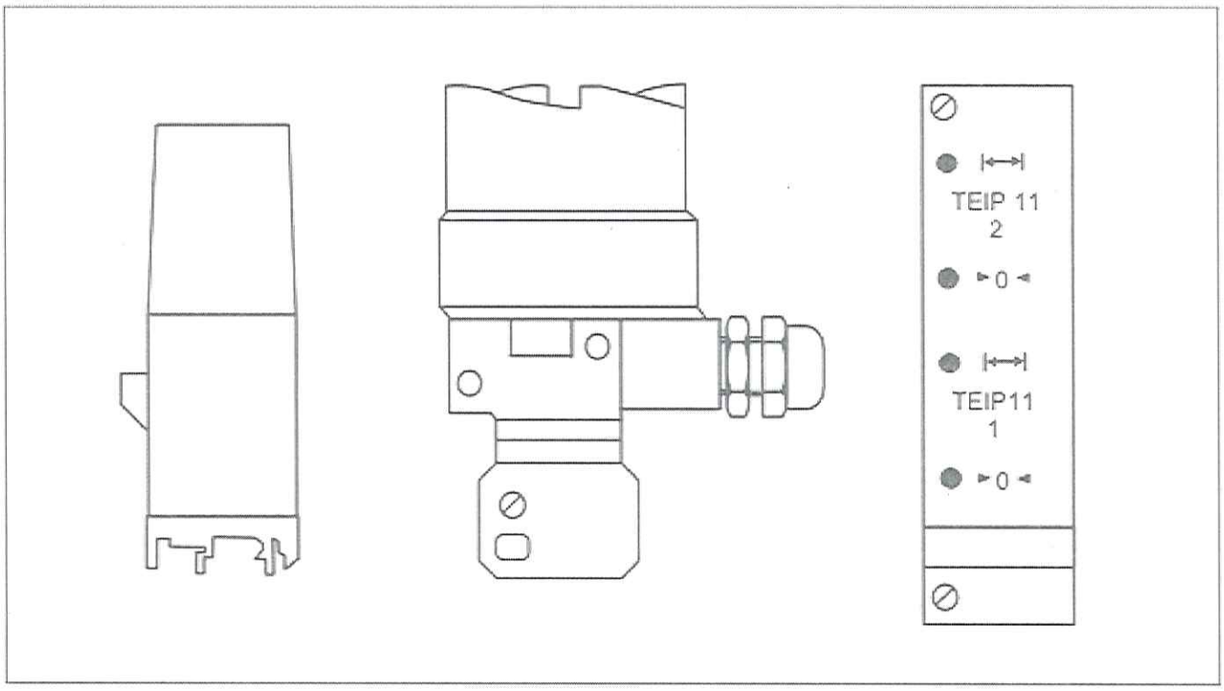
TEIP 11

I/P Signal converter

Operating manual

42/18-46 EN

Rev. 05



ABB

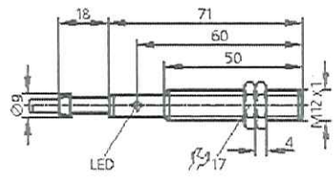
efector100 ifm electronic

Inductive sensors

IF5863

IFA3002-BPKG
Inductive sensor
Metal thread M12 x 1
Cable

Sensing range 2mm [f]
flush mountable

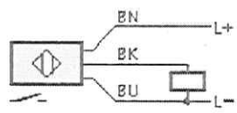


CE

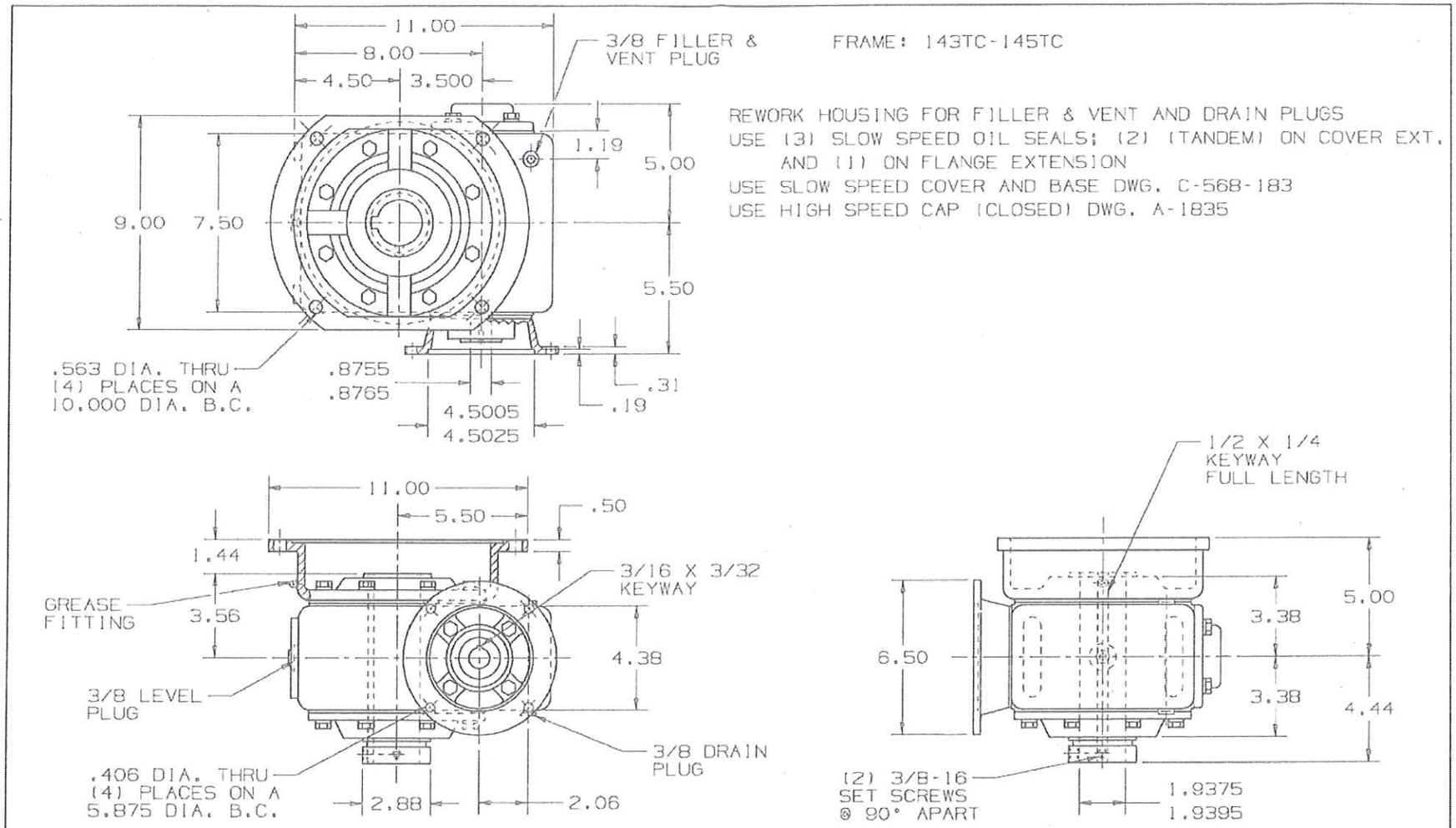
Electrical design	**DC PNP**
Output	**normally open**
Operating voltage [V]	10...36 DC
Current rating [mA]	250
Short-circuit protection	Yes (non-latching)
Reverse polarity protection	yes
overload protection	yes
Voltage drop [V]	< 2.5
Current consumption [mA]	< 15 (24 V)
Real sensing range [mm]	2 ± 10 %
Operating distance [mm]	0...1.6
Switch-point drift [% / Sr]	-10...10
Hysteresis [% / Sr]	1...15
Switching frequency [Hz]	800
Correction factors	mild steel = 1 / stainless steel approx. 0.7 / brass approx. 0.4 / Al approx. 0.3 / Cu approx. 0.2
Operating temperature [°C]	-25...80
Protection	IP 67 ⧈
EMC	EN 60947-5-2 EN 55011: class B
Housing material	brass Optalloy-plated; PC (polycarbonate)
Function display Switching status LED	red
Connection	PVC cable / 2 m; 3 x 0.34 mm²

Wiring

Core colors
BN brown
BU blue
BK black



Accessories (included)	2 lock nuts



OUTLINE SPECIAL ASSEMBLY "DL"	MOUNTING CEILING	REVISIONS	THIS DRAWING IS THE PROPERTY OF PEERLESS-WINSMITH AND SHALL BE USED ONLY IN CONNECTION WITH CONTRACTS AND PROPOSALS OF THE COMPANY. RECIPIENT AGREES NOT TO USE THIS DRAWING OR INFORMATION IT CONTAINS IN ANY WAY DETRIMENTAL TO PEERLESS-WINSMITH	DRAWN BY JHS	PEERLESS-WINSMITH
UNIT 6MSF WORM GEAR REDUCER	RATIO 10:1 DATE 1/07			DATE 8-10-99	SPRINGVILLE, NEW YORK 14141
CERTIFIED CORRECT FOR WYSSMONT COMPANY INC.	ORDER NO. J530-8			SCALE .250	SIZE B DWG NO. 006MSFS-456-X REV A
	APPROVED BY 1/10/07 TH			CHECKED BY JBS	

REL. S.O.	FRAME	HP	TYPE	PHASE/ HERTZ	RPM	VOLTS
-	56/140	1.0	P	3/60	1725	230/460

AMPS	DUTY	AMB °C/ INSUL.	S.F.	NEMA DESIGN	CODE LETTER	ENCL.
2.8/1.4	CONT	40/F	1.15	-	J	NV/FC

E/S	ROTOR	TEST S.O.	TEST DATE	STATOR RES.@25 °C OHMS (BETWEEN LINES)
500357-38	602482-66-E	EDM85267	3/23/03	6/24

PERFORMANCE

LOAD	HP	AMPERES	RPM	% POWER FACTOR	% EFFICIENCY
NO LOAD	0	.82	1799	9.00	0
1/4	.28	.88	1789	38.0	79.0
2/4	.54	1.0	1777	58.1	85.2
3/4	.79	1.2	1765	71.0	86.6
4/4	1.04	1.4	1755	78.9	85.6
5/4	1.29	1.7	1736	83.4	84.6
6/4	1.55	2.0	1721	86.3	82.8

SPEED TORQUE

	RPM	TORQUE % FULL LOAD	TORQUE LB.-FT.	AMPERES
LOCKED ROTOR	0	200	6.25	9.5
PULL UP	350	186	5.80	8.0
BREAKDOWN	1425	307	9.58	4.8
FULL LOAD	1755	100	3.12	1.4

AMPERES SHOWN FOR 460. VOLT CONNECTION. IF OTHER VOLTAGE CONNECTIONS ARE AVAILABLE, THE AMPERES WILL VARY INVERSELY WITH THE RATED VOLTAGE

REMARKS: NEMA NOM EFF 82.5 % MINIMUM EFF 80 %
PF= 79%

RELIANCE ELECTRIC

DR. BY W.A.EWING
CK. BY W.A.EWING
APP. BY M.SWINNEY
DATE 4/09/03

A-C MOTOR PERFORMANCE DATA M8330
ISSUE DATE 4/09/03

Installation and
Operation Manual

Fractional Horsepower Duty Master® A-C Motors

- Type CS, Capacitor Start
- Type P, Polyphase
- 1/8 Thru 3 hp
- 48-56-140T

Reliance
Electric

A-C MOTORS

We're keyed to your need.

Instruction Manual B-3622-13

June, 1988