

# **ANGI Electronic Priority Panel With ESD**

## **Operator & Maintenance Manual**

**K01-11-200P**

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## WARRANTY

ANGI hereby warrants that the EQUIPMENT sold hereunder shall be free of defects in material and workmanship appearing within 12 months from the date the EQUIPMENT is placed into service or 18 months from the date the GOODS are available to be shipped; whichever comes first. PURCHASER must give written notice of any defect covered by this warranty to ANGI within the warranty period. For any defect covered by this warranty, ANGI shall repair or replace the EQUIPMENT. Repairs or replacement parts are warranted for 90 days from the date that the repaired or replaced EQUIPMENT OR GOODS are shipped from the factory or until termination of the original warranty, whichever is longer. This warranty does not cover labor costs and other contingent expenses for the diagnosis of defects or for removal and reinstallation of the EQUIPMENT. Such repair or replacement shall be PURCHASER's sole and exclusive remedy for ANGI's breach of this AGREEMENT.

This warranty does not extend to any GOODS or EQUIPMENT which have been (a) subject to misuse, neglect, accidents, acts of God, or causes of a similar nature; (b) repaired or altered by anyone other than ANGI, without ANGI's prior approval; (c) improperly installed by anyone other than ANGI or someone under its direction or (d) to consumable parts or materials such as filter elements, seals, belts, or fuses, or (e) damage resulting from overloading the GOODS or EQUIPMENT. This warranty does not extend to nor does ANGI provide any warranty to components such as motors and drive engines that are separately covered by a warranty issued by their respective manufacturers. ANGI shall transfer or pass through to PURCHASER any such warranties received by ANGI. This warranty is in lieu of all other warranties expressed or implied.

**EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW, THIS IS THE ONLY WARRANTY GIVEN FOR THE SALE OF GOODS, EQUIPMENT AND/ OR SERVICES. NO WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE SHALL APPLY. IN NO EVENT SHALL ANGI BE LIABLE FOR CONSEQUENTIAL, SPECIAL, INDIRECT, PUNITIVE, OR INCIDENTAL DAMAGES RESULTING FROM THE PURCHASE OR USE OF ANGI EQUIPMENT, GOODS, AND/OR SERVICES RESULTING FROM ANY DELAYS OR FAILURE OF PERFORMANCE OF ANGI UNDER ANY AGREEMENT BETWEEN ANGI AND PURCHASER, OR RESULTING FROM ANY SERVICES FURNISHED BY ANGI.**

This warranty may not be modified, amended, or otherwise changed except by a written document properly executed by ANGI.

*For warranty issues contact:* Customer Service  
**ANGI Energy Systems, Inc.**  
305 W. Delavan Dr.  
Janesville, WI, USA 53546

Phone: 608-563-2800  
Fax: 608-531-2635  
E-mail: [service@angienergy.com](mailto:service@angienergy.com)  
Website: [www.angienergy.com](http://www.angienergy.com)

## **CAUTION**

**Compressed gasses can be dangerous if careless handling practices are used.**

- When depressurizing a system keep fingers and hands away from the gas stream. High-pressure gasses can penetrate skin.

**Natural gas can be explosive.**

- Never use any open flame in close proximity to natural gas.
- Do not operate any systems with any electrical panel open.
- Observe all safety procedures set forth by your employer.
- Do not open energized electrical panels when gas is present.

**Operate high-pressure valves with caution.**

## **Set-up and Operational Adjustments**

**This panel shall only be installed and serviced by qualified personnel**

It is important to periodically check the panel for leaks. New panels can develop leaks in shipping and installation. **Never tighten any fittings when compressor is running or panel is pressurized.**

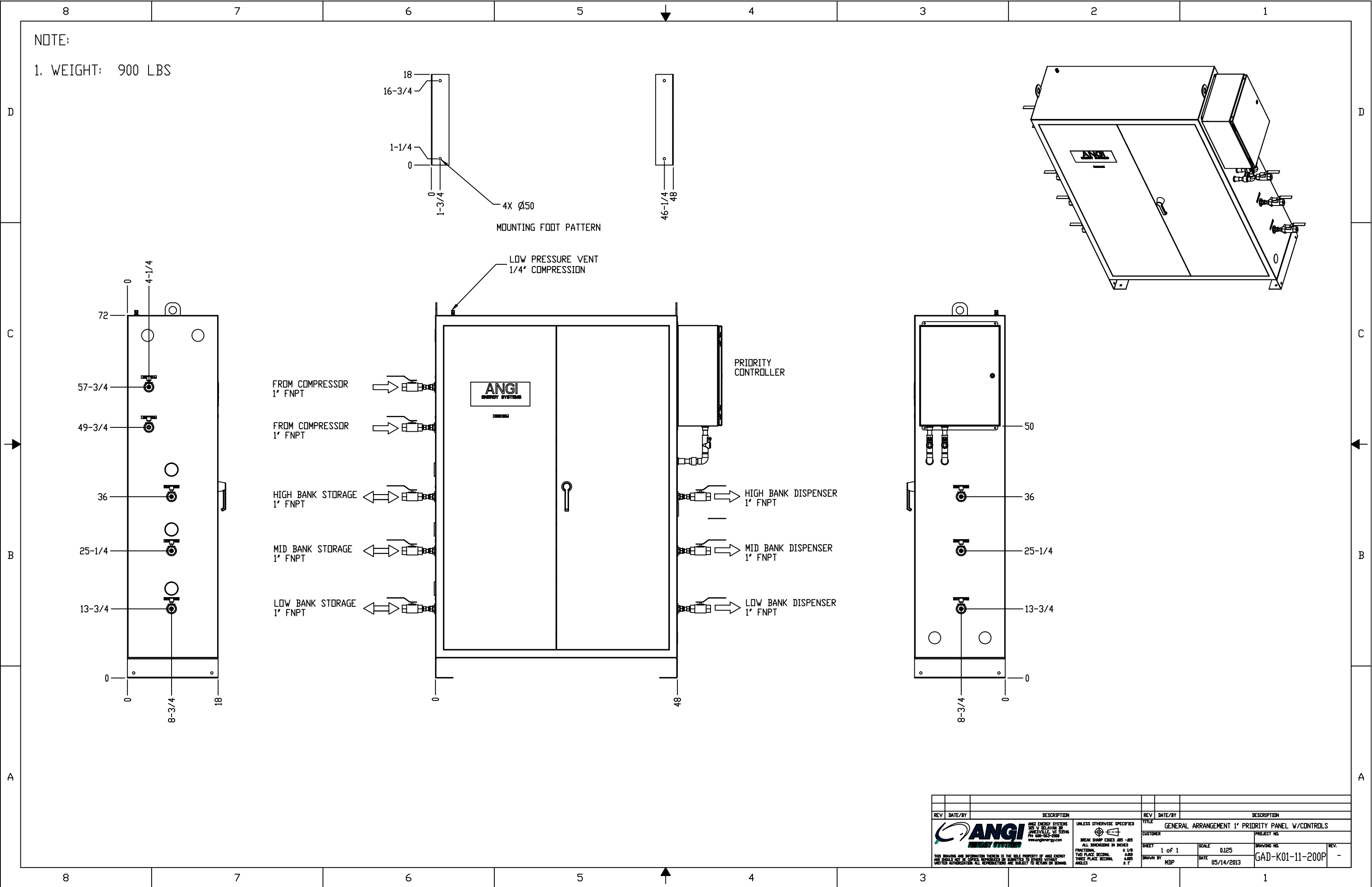
No adjustments are required in this panel.

## **Maintenance**

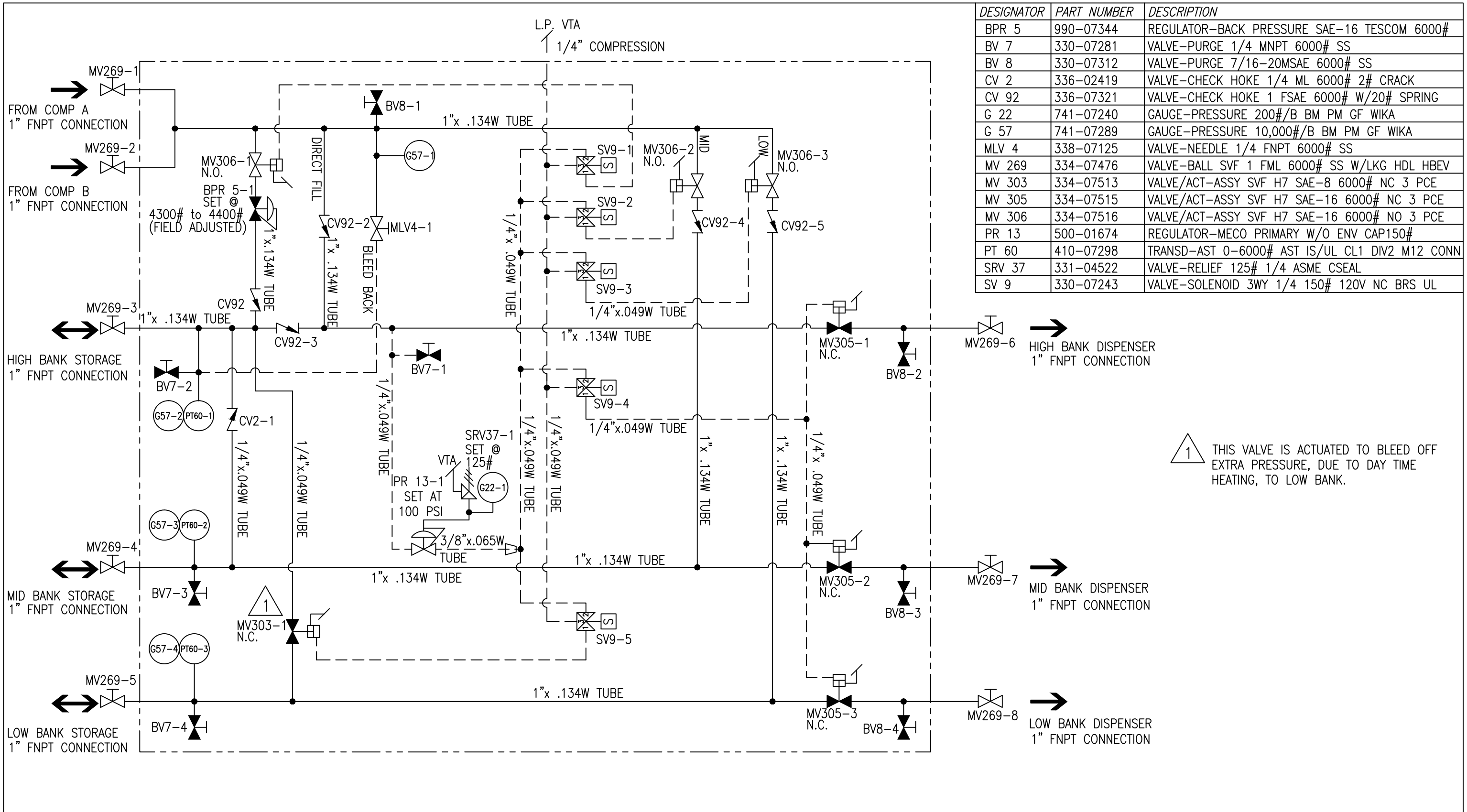
**Leaks:** Leaks can and do occur. To repair leaks depressurize the system and perform necessary steps to repair leaks.

**Gauges:** Over time, liquid filled gauges can lose some of its glycerin fill. Glycerin can be purchased at a local pharmacy and topped off through the rubber fill stopper on the top of the gauge.









| DESIGNATOR | PART NUMBER | DESCRIPTION                                    |
|------------|-------------|------------------------------------------------|
| BPR 5      | 990-07344   | REGULATOR-BACK PRESSURE SAE-16 TESCOM 6000#    |
| BV 7       | 330-07281   | VALVE-PURGE 1/4 MNPT 6000# SS                  |
| BV 8       | 330-07312   | VALVE-PURGE 7/16-20MSAE 6000# SS               |
| CV 2       | 336-02419   | VALVE-CHECK HOKE 1/4 ML 6000# 2# CRACK         |
| CV 92      | 336-07321   | VALVE-CHECK HOKE 1 FSAE 6000# W/20# SPRING     |
| G 22       | 741-07240   | GAUGE-PRESSURE 200#/B BM PM GF WIKA            |
| G 57       | 741-07289   | GAUGE-PRESSURE 10,000#/B BM PM GF WIKA         |
| MLV 4      | 338-07125   | VALVE-NEEDLE 1/4 FNPT 6000# SS                 |
| MV 269     | 334-07476   | VALVE-BALL SVF 1 FML 6000# SS W/LKG HDL HBEV   |
| MV 303     | 334-07513   | VALVE/ACT-ASSY SVF H7 SAE-8 6000# NC 3 PCE     |
| MV 305     | 334-07515   | VALVE/ACT-ASSY SVF H7 SAE-16 6000# NC 3 PCE    |
| MV 306     | 334-07516   | VALVE/ACT-ASSY SVF H7 SAE-16 6000# NO 3 PCE    |
| PR 13      | 500-01674   | REGULATOR-MECO PRIMARY W/O ENV CAP150#         |
| PT 60      | 410-07298   | TRANSD-AST 0-6000# AST IS/UL CL1 DIV2 M12 CONN |
| SRV 37     | 331-04522   | VALVE-RELIEF 125# 1/4 ASME CSEAL               |
| SV 9       | 330-07243   | VALVE-SOLENOID 3WY 1/4 150# 120V NC BRS UL     |

1 THIS VALVE IS ACTUATED TO BLEED OFF EXTRA PRESSURE, DUE TO DAY TIME HEATING, TO LOW BANK.

|     |                 |                                                          |  |  |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                          |                                                                                                                            |            |             |                 |  |   |
|-----|-----------------|----------------------------------------------------------|--|--|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|------------|-------------|-----------------|--|---|
|     |                 |                                                          |  |  |     |  <div>ANGI ENERGY SYSTEMS<br/>305 W DELAVAN DR<br/>JANESVILLE, WI 53546<br/>PH: 608-563-2800<br/>www.angienergy.com</div> <div>THIS DRAWING AND ALL INFORMATION THEREIN IS THE SOLE PROPERTY OF ANGI ENERGY AND SHOULD NOT BE COPIED, REPRODUCED, OR SUBMITTED TO OTHERS' WITHOUT WRITTEN AUTHORIZATION. ALL REPRODUCTIONS ARE SUBJECT TO RETURN ON DEMAND.</div> | UNLESS OTHERWISE SPECIFIED<br><br>BREAK SHARP EDGES .005-.015<br>ALL DIMENSIONS IN INCHES<br>FRACTIONAL ± 1/8<br>TWO PLACE DECIMAL ±.010<br>THREE PLACE DECIMAL ±.005<br>ANGLES ±1° | TITLE PRIORITY PANEL-1" ELECTRONIC HIGH FLOW W/ ESD (2) INLET<br>W/H7 SAE ACT VLVS & CHECK VLVS, GAS CONTROLS ON SIDE-P&ID |            |             |                 |  |   |
|     |                 |                                                          |  |  |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                        | CUSTOMER                                                                                                                                                                                                                                                                 |                                                                                                                            |            | PROJECT NO. |                 |  |   |
| A   | 08/21/13<br>MDP | REMOVED PIPE MANIFOLD, CHG'D TRANSDUCER<br>ECN 130821-02 |  |  |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                          | SHEET 1/1                                                                                                                  | SCALE NONE | DRAWING NO. | REV.            |  |   |
| REV | DATE/BY         | DESCRIPTION                                              |  |  | REV |                                                                                                                                                                                                                                                                                                                                                                                                                                                        | DATE/BY                                                                                                                                                                                                                                                                  | DESCRIPTION                                                                                                                |            |             | PID-K01-11-200P |  | A |
|     |                 |                                                          |  |  |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                          |                                                                                                                            |            |             |                 |  |   |



| DRAWING INDEX |                                                       |
|---------------|-------------------------------------------------------|
| PAGE          | DESCRIPTION                                           |
| 1             | INDEX AND GENERAL INFORMATION                         |
| 2             | 110VAC POWER AND 24VDC POWER DISTRIBUTION             |
| 3             | PLC DIGITAL INPUT CONNECTIONS                         |
| 4             | PLC DIGITAL OUTPUT CONNECTIONS                        |
| 5             | COMPONENT WIRING DETAILS – PLC POWER & COMMUNICATIONS |
| 6             | ETHERNET CONNECTIONS                                  |



| FUSE CHART |                  |      |
|------------|------------------|------|
| FUSE #     | ANGI PART NUMBER | AMPS |
| FU-1       | 440-07254        | 5    |
| FU-2       | 440-07307        | 3    |
| FU-3       | 440-07307        | 3    |
| FU-4       | 440-07307        | 3    |
| FU-5       | 440-07307        | 3    |
| FU-6       | 440-07307        | 3    |
| FU-7       | 440-07307        | 3    |
| FU-8       | 440-07307        | 3    |

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JANESVILLE, WI - USA

793-08003

JOB NUMBER 40436-03

SCHEMATIC A80-30-40436-03

PRIMARY SUPPLY AMPS 5

VOLTS 120VAC PHASE 1 HZ 60

SECONDARY SUPPLY AMPS 3

VOLTS 24VDC PHASE 1 HZ

MOTOR HP N/A FLA N/A

ENCL. TYPE 4

SHORT CIRCUIT CURRENT RATING 5KAIC

HAZARDOUS LOCATION RATING

CLASS 1 DIV 2 GROUP A,B,C,D

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PRIORITY CONTROL PANEL

NOTE: ALL ELECTRICAL CONNECTION MUST BE COMPLETED OR SUPERVISED BY QUALIFIED PERSONNEL, AND MEET ALL LOCAL AND APPLICABLE CODES. REFER TO NEC FOR MORE INFORMATION.

| UL FILE AND PANEL TYPE |               |                                                                         |
|------------------------|---------------|-------------------------------------------------------------------------|
| X                      | NNNY.E328888  | INDUSTRIAL CONTROL PANELS AND ASSEMBLIES FOR USE IN HAZARDOUS LOCATIONS |
|                        | NRBX.E334511  | INDUSTRIAL CONTROL PANELS RELATING TO HAZARDOUS LOCATIONS               |
|                        | NITW.E319535  | INDUSTRIAL CONTROL PANELS                                               |
|                        |               | THIRD PARTY CERTIFICATION REQUIRED                                      |
|                        | NON CERTIFIED | NO CERTIFICATION REQUIRED / AVAILABLE                                   |

|     |         |             |     |         |             |
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| REV | DATE/BY | DESCRIPTION | REV | DATE/BY | DESCRIPTION |



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UNLESS OTHERWISE SPECIFIED  
BREAK SHARP EDGES .005-.015  
ALL DIMENSIONS IN INCHES  
FRACTIONAL ± 1/8  
TWO PLACE DECIMAL ±.010  
THREE PLACE DECIMAL ±.005  
ANGLES ±1°

TITLE  
PRIORITY PANEL  
TITLE – LINE 2

CUSTOMER  
ZEIT ENGINEERING

PROJECT NO.  
40436-03

DRN JMD DATE 05/29/13 SCALE 1:1  
CHK YYY DATE MM/DD/YY SHT 1 TOT 6

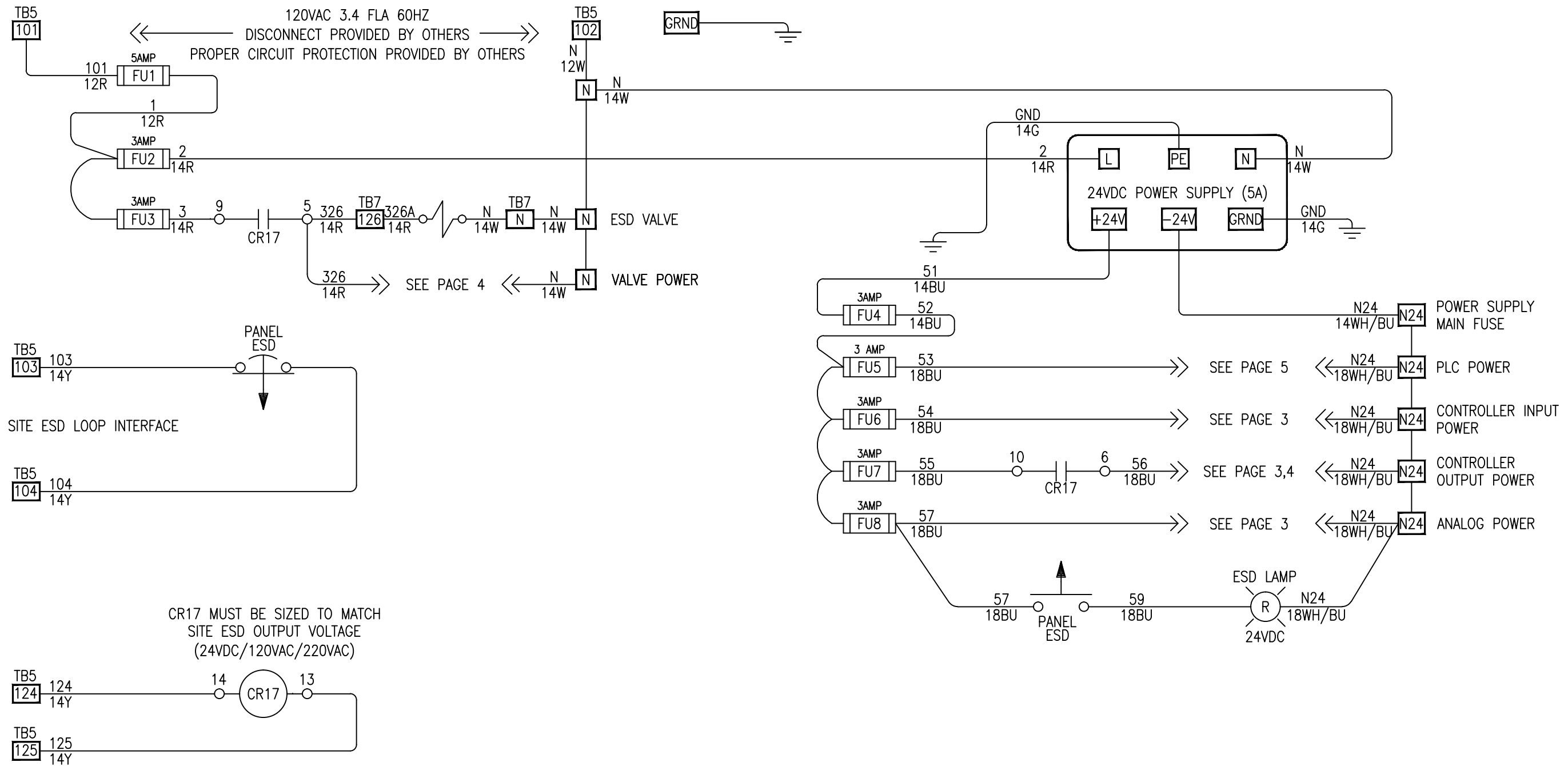
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AUTOCAD WINDCHILL





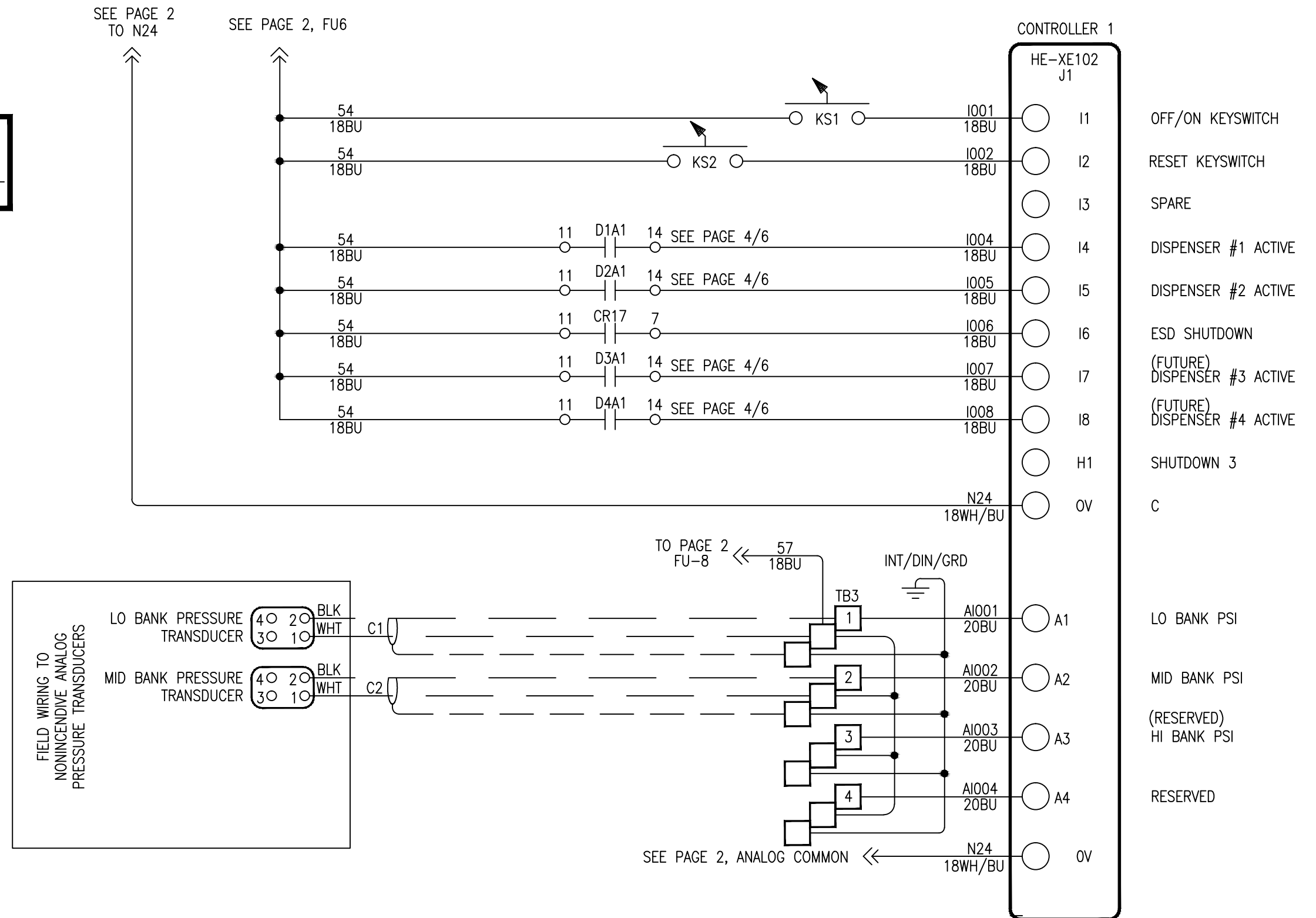
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THIS DRAWING COMPLIES WITH AGENCY LISTINGS. DO NOT CHANGE WITHOUT APPROVAL FROM ENGINEERING DEPARTMENT.

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|  |  |  |  |  |  | <div><p>ANGI ENERGY SYSTEMS<br/>305 W DELAVAN DR<br/>JANESVILLE, WI 53546<br/>PH: 608-563-2800<br/>www.angienergy.com</p></div> <div>THIS DRAWING AND ALL INFORMATION THEREIN IS THE SOLE PROPERTY OF ANGI ENERGY AND SHOULD NOT BE COPIED, REPRODUCED, OR SUBMITTED TO OTHERS WITHOUT WRITTEN AUTHORIZATION. ALL REPRODUCTIONS ARE SUBJECT TO RETURN ON DEMAND.</div> |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | </ |
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**ANGI**  
ENERGY SYSTEMS

ANGI ENERGY SYSTEMS  
305 W DELAVAN DR  
JANESVILLE, WI 53546  
PH: 608-563-2800  
www.angienergy.com

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UNLESS OTHERWISE SPECIFIED

BREAK SHARP EDGES .005-.015

ALL DIMENSIONS IN INCHES

FRACTIONAL ± 1/8

TWO PLACE DECIMAL ±.010

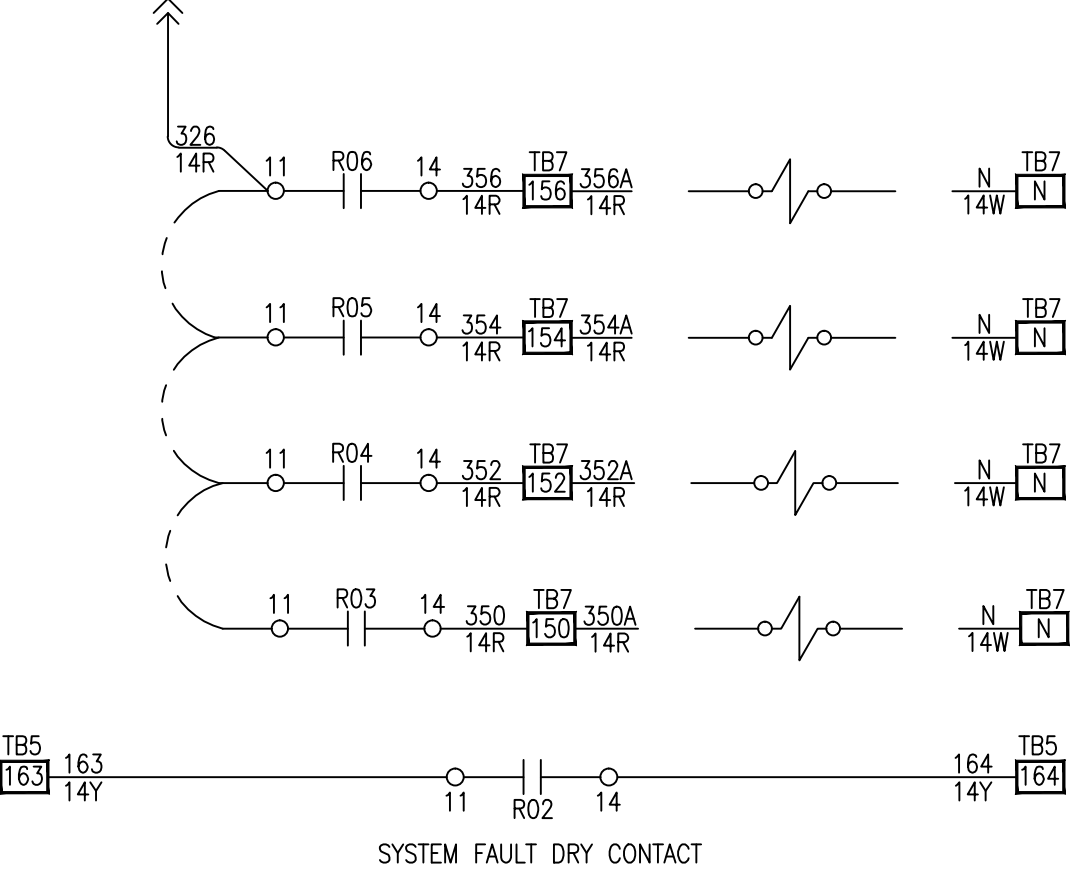
THREE PLACE DECIMAL ±.005

ANGLES ±1°

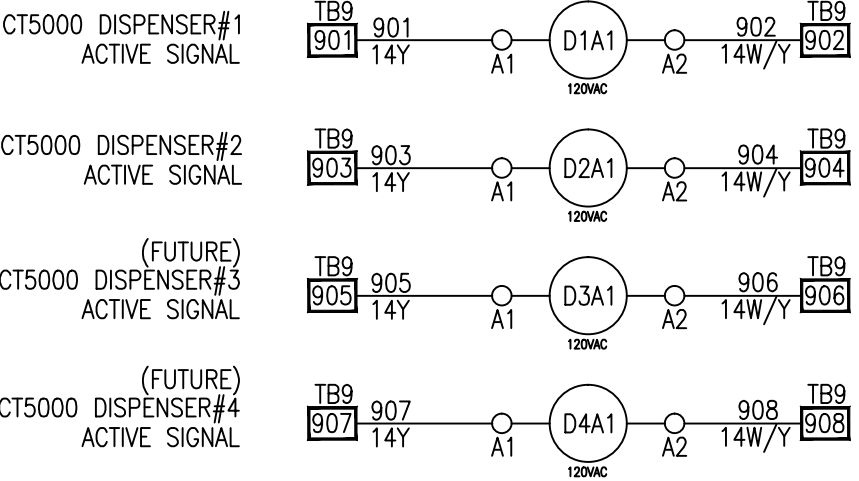
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|----------|---------------|----------------------------------|-----------------|----------------------|------|
| TITLE    |               | PRIORITY PANEL<br>TITLE - LINE 2 |                 |                      |      |
| CUSTOMER |               | ZEIT ENGINEERING                 |                 | PROJECT NO. 40436-03 |      |
| DRN JMD  | DATE 05/29/13 | SCALE 1:1                        | DRAWING NO.     |                      | REV. |
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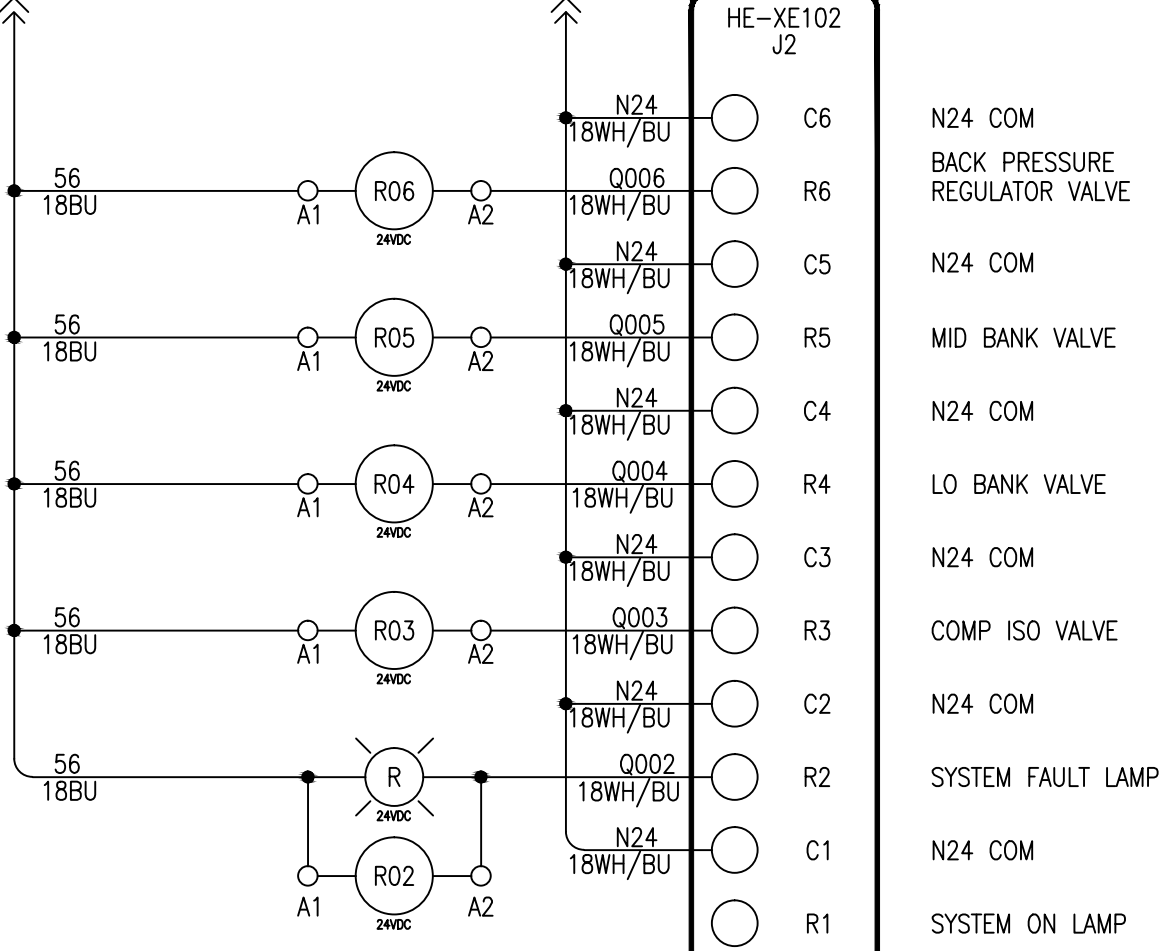
SEE PAGE 2, CR17-5



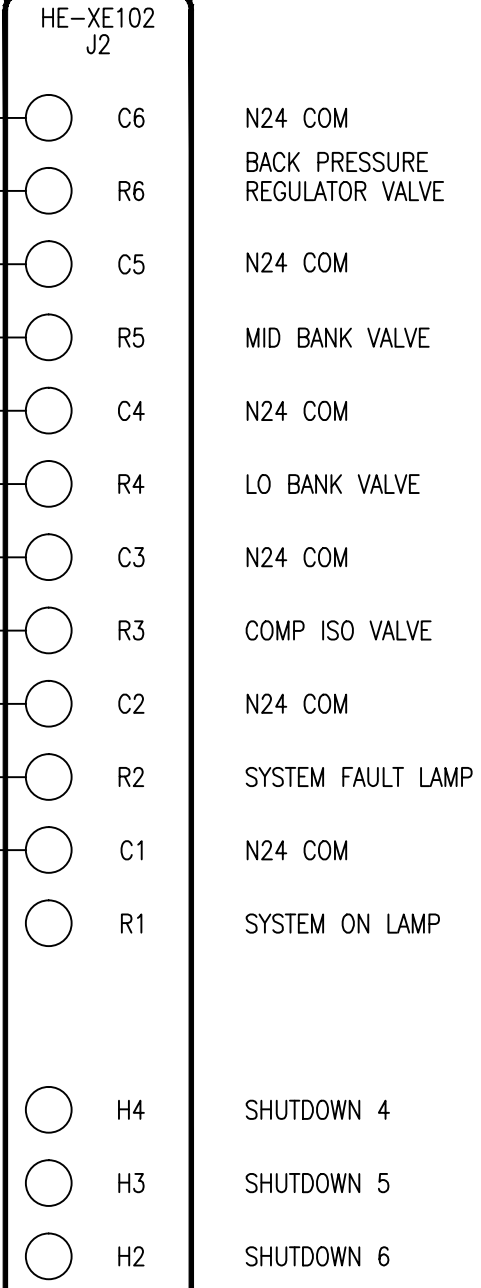
SEE PAGE 3/6



SEE PAGE 2, CR17-6



SEE PAGE 2 TO N24  
CONTROLLER 1



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ALL DIMENSIONS IN INCHES

FRACTIONAL ± 1/8  
TWO PLACE DECIMAL ±.010  
THREE PLACE DECIMAL ±.005  
ANGLES ±1°

TITLE  
PRIORITY PANEL  
TITLE - LINE 2

CUSTOMER  
ZEIT ENGINEERING

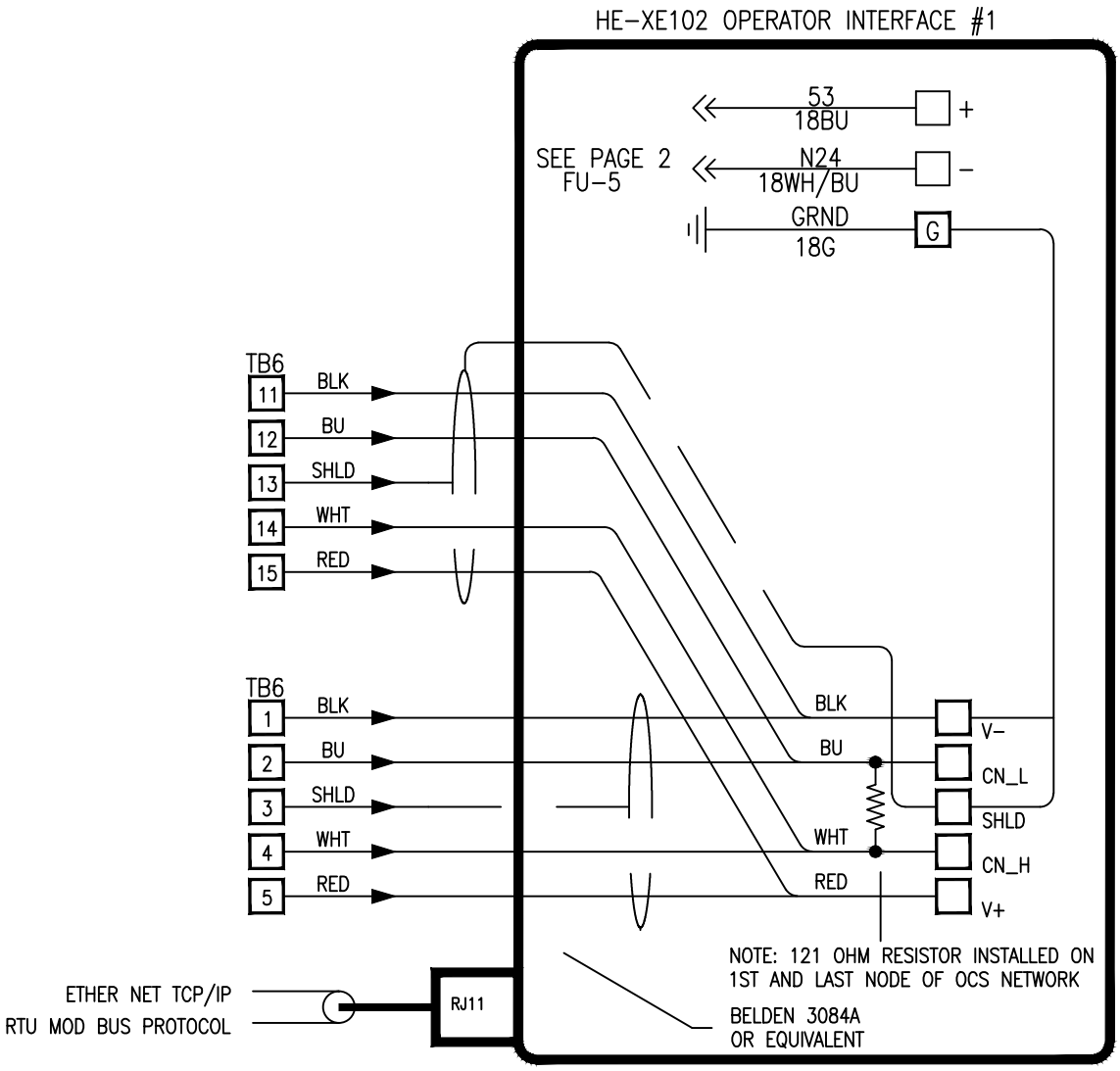
PROJECT NO.  
40436-03

DRN JMD DATE 05/29/13 SCALE 1:1  
CHK YYY DATE MM/DD/YY SHT 4 TOT 6

DRAWING NO.  
A80-30-40436-03

REV.  
-



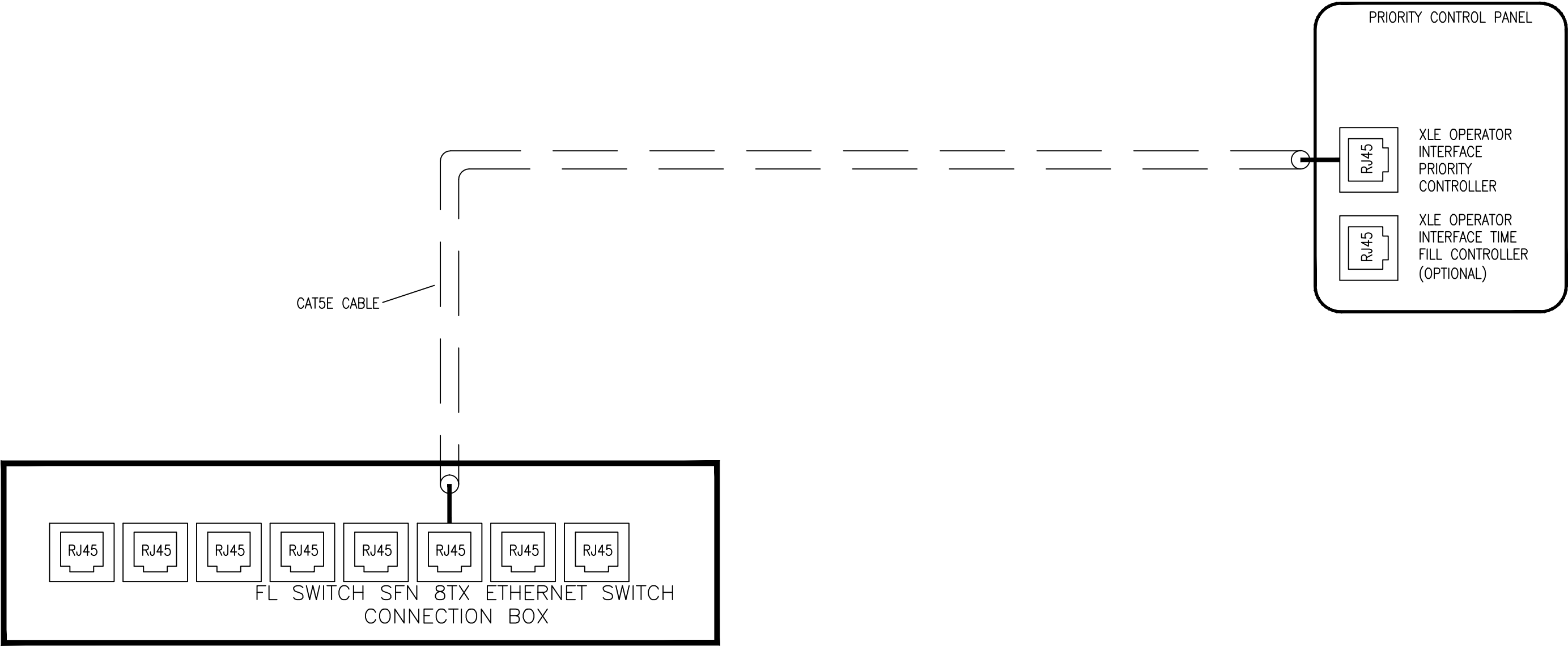


**CONTROLLED DRAWING**  
THIS DRAWING COMPLIES WITH AGENCY LISTINGS. DO NOT CHANGE WITHOUT APPROVAL FROM ENGINEERING DEPARTMENT.

PLC POWER AND COMMUNICATIONS FIELD CONNECTION DETAILS

|     |         |             |  |  |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                        |  |                                           |                   |                         |             |                 |   |
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|     |         |             |  |  |     | <div><div>ANGI ENERGY SYSTEMS<br/>305 W DELAVAN DR<br/>JANESVILLE, WI 53546<br/>PH: 608-563-2800<br/>www.angienergy.com</div><div>THIS DRAWING AND ALL INFORMATION THEREIN IS THE SOLE PROPERTY OF ANGI ENERGY AND SHOULD NOT BE COPIED, REPRODUCED, OR SUBMITTED TO OTHERS WITHOUT WRITTEN AUTHORIZATION. ALL REPRODUCTIONS ARE SUBJECT TO RETURN ON DEMAND.</div></div> | UNLESS OTHERWISE SPECIFIED                                                             |  | TITLE<br>PRIORITY PANEL<br>TITLE - LINE 2 |                   |                         |             |                 |   |
|     |         |             |  |  |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                |   |  | CUSTOMER<br>ZEIT ENGINEERING              |                   | PROJECT NO.<br>40436-03 |             |                 |   |
|     |         |             |  |  |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                | BREAK SHARP EDGES .005-.015<br>ALL DIMENSIONS IN INCHES                                |  | DRN<br>JMD                                | DATE<br>05/29/13  | SCALE<br>1:1            | DRAWING NO. | REV.            |   |
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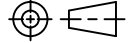


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BREAK SHARP EDGES .005-.015  
ALL DIMENSIONS IN INCHES

|                     |       |
|---------------------|-------|
| FRACTIONAL          | ± 1/8 |
| TWO PLACE DECIMAL   | ±.010 |
| THREE PLACE DECIMAL | ±.005 |
| ANGLES              | ±1°   |

|          |     |      |                  |                 |             |
|----------|-----|------|------------------|-----------------|-------------|
| TITLE    |     |      |                  | PRIORITY PANEL  |             |
|          |     |      |                  | TITLE - LINE 2  |             |
| CUSTOMER |     |      | ZEIT ENGINEERING |                 | PROJECT NO. |
|          |     |      |                  |                 | 40436-03    |
| DRN      | JMD | DATE | 05/29/13         | SCALE           | 1:1         |
| CHK      | YYY | DATE | MM/DD/YY         | SHT             | 6           |
|          |     |      |                  | TOT             | 6           |
|          |     |      |                  | DRAWING NO.     |             |
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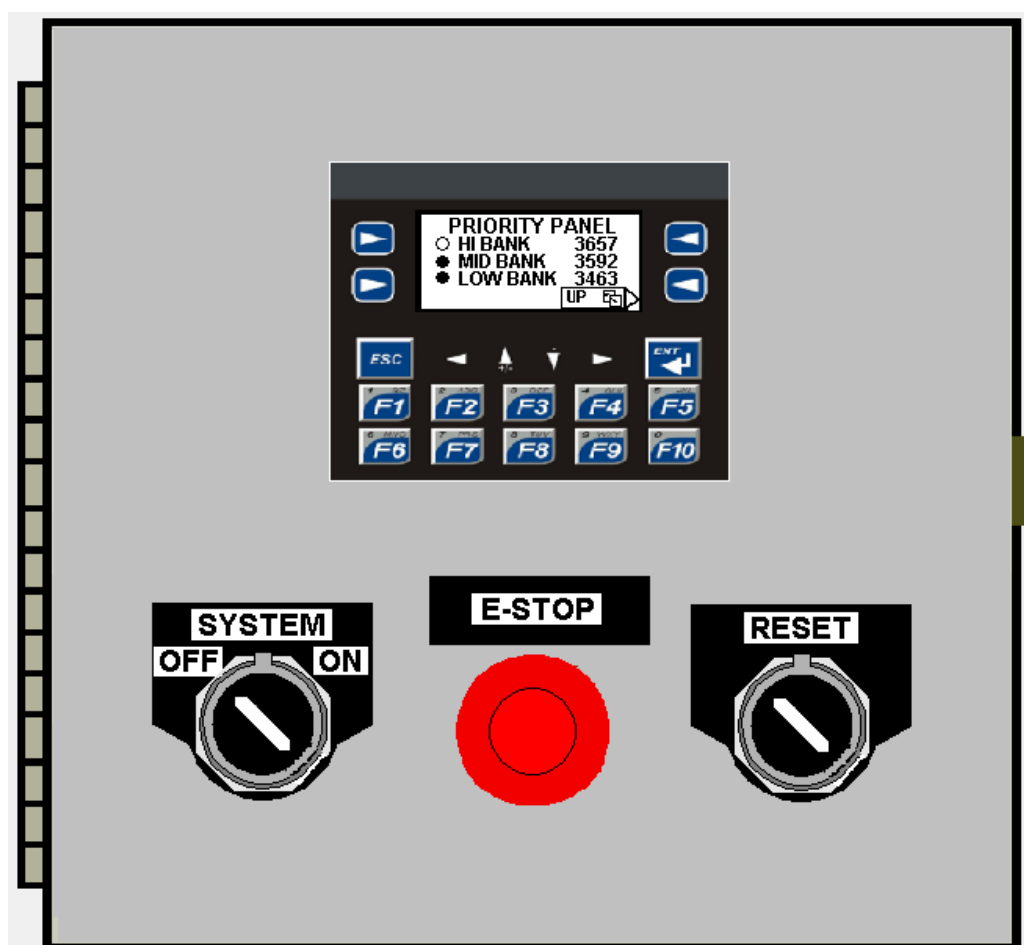


## OPERATION MANUAL

---

### ELECTRONIC PRIORITY PANEL (EPP) with XLE-OCS Control

---





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## ELECTRONIC PRIORITY PANEL (EPP) XLE - OCS Control

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### SPECIFICATIONS

#### Electronic Priority Panel

|                          |                         |
|--------------------------|-------------------------|
| Control System.....      | ANGI EPP Control System |
| Power Supply Output..... | 24 VDC @ 2.0 Amps       |
| Power Supply Input.....  | 100-240 VAC, 50/60 Hz   |
| Maximum Temperature..... | 50° C                   |

#### XLE Parameters

|                        |                            |
|------------------------|----------------------------|
| Software Package.....  | CScape™                    |
| Network.....           | CsCAN™, Ethernet           |
| Network ID.....        | Programmable               |
| Network Baud.....      | 125K (CsCAN™)              |
| Firmware Revision..... | refer System Configuration |
| BIOS Revision.....     | refer System Configuration |

#### Electronic Priority Program Outline

|                            |                                       |
|----------------------------|---------------------------------------|
| Configure Parameters.....  | configure machine parameters          |
| Networks.....              | write node data to master             |
| Screens.....               | main screen logic                     |
| Text Tables.....           | text table to I/O pointers            |
| Analog Input Monitor.....  | read analog inputs                    |
| Digital Input Monitor..... | read digital inputs                   |
| Priority Sequence.....     | Priority valve sequence control       |
| Outputs.....               | digital outputs & display lamps       |
| Valve Monitor.....         | log maintenance events                |
| AI Monitor sbr.....        | scale analog input & fault subroutine |
| DI Monitor sbr.....        | digital input fault subroutine        |
| Alarm Control.....         | alarm screen subroutine               |
| Alarm Load Log sbr.....    | time & date stamp fault subroutine    |
| Alarm Log Display.....     | fault log history subroutine          |



## **ELECTRONIC PRIORITY PANEL (EPP) XLE - OCS Control**

Page 4 of 10

### **IMPORTANT INFORMATION**

#### **USER MODIFICATION**

ANGI must authorize all modification to this equipment. Any unauthorized modification to this equipment and or software will void the warranty. Modification may damage the equipment and cause bodily injury.

#### **DISCLAIMER**

ANGI disclaims any responsibilities whatsoever to the customer or to any person for injury or damage to, or loss of, property or value resulting from the use of its products which have been subjected to misuse, accidents, misapplied, repaired by unauthorized person, or improperly installed.

**NOTICE:** This manual is as current as possible at the time of printing and is subject to change without notice. For information not covered in this manual or further clarification, contact ANGI Customer Service.

**CONTRACTOR OR INSTALLER:** Leave this manual with the Unit station after installation is complete.

**CUSTOMER:** Retain this manual for future reference.



## **ELECTRONIC PRIORITY PANEL (EPP) XLE - OCS Control**

Page 5 of 10

### **1. INTRODUCTION**

Virtual RUN and OK LEDS can be accessed by pressing the SYSTEM key.

This manual contains information on the operation and maintenance of ANGI Electronic Priority Panel, EPP, used in storage fill applications. The priority panel is designed for continuous duty, unattended operation.

The Electronic Priority Panel is controlled by an ANGI XLE control system. It provides automated valve operation, shut down limit monitoring, fault annunciation, and remote paging annunciation.

The ANGI XLE includes a graphical screen display and includes 12 Digital DC Inputs 4 Analog Inputs (Medium Resolution) 6 Digital Relay Outputs. The XLE provides controller, networking, I/O and operator interface capabilities in one unit using a visual graphic display screen. The OCS has Serial and CAN (Controller Area Network) communication ports. The controller includes embedded features such as Ethernet, MicroFLASH® and Web Server. The units contain an RS-232 port for programming, debugging, monitoring and network administration from an IBM-compatible PC.

Cscape Software is used with the Graphical OCS. The Windows - based software package aids in the integration of a CAN-based Distributed Control System. The program is used for configuring controllers. Cscape is also used for OCS ladder logic, user displays, network configuration for global digital and analog data, setting system-wide security and monitoring other controllers in the system. One serial connection to any node on the network (i.e., CsCAN Network), the program has control over the entire system. The operator can upload, download, monitor and debug to any node on the network.

RUN and OK LEDS are physically located on the front panel of the XLE. CAN OK, and FIBER OK LEDS can be viewed on the back of the XLE OCS next to the fiber connector.



## **ELECTRONIC PRIORITY PANEL (EPP) XLE - OCS Control**

Page 6 of 10

### **2. NETWORKS**

The NX Controller has several network options to allow remote communications.

CsCAN is a peer-to-peer network developed by Horner Electric. CsCAN is similar to RS485 with multi-drop Nodes on the network. Networks exceeding the maximum total cable length must make use of repeaters. For example, a 125KBaud network running on Belden 3084A Cable can be extended from 500 meters. The two nodes at the physical end-points need to have 121 ohm, 1%, ¼ Watt terminating resistors connected across the CN\_L and CN\_H terminals.

Ethernet is built into Horner OCS controllers to provide advanced Ethernet communication capabilities. The Ethernet port Module uses a standard TCP/IP protocol. The RJ45 connector with a CAT5 or CAT6 cable can connect to a network hub/switch. It can communicate beyond the local network and onto the Internet. To do so, the Ethernet must be configured with the IP Address of a Network Gateway server, which allows communication outside the local network.

### CONTROLS & INSTRUMENTATION

#### 2.1. Control System Overview

The Electronic Priority Panel, EPP, was developed by ANGI to provide fully automatic, unattended operation. The OCS controller provides fault code annunciation and log for quick fault recovery.

#### 2.2. Emergency Shutdown

The Emergency Shutdown, ESD, is remotely monitored by the ESD control relay located in the Master/Compressor Unit Control Panel. ESD is active when the remote ESD Master Relay (MCP/UCP) is de-energized. The ESD pushbutton, located on the EPP panel, may activate an ESD. Also Gas Detectors that sense a High Gas Alarm will activate an ESD. Once ESD is active, the Emergency Shutdown closes the Priority ESD Valve. The OCS activates an ESD fault screen and illuminates an ESD lamp. Activate the Reset pushbutton (MCP/UCP) to return the Priority Panel to normal operation. Note the Priority Panel Reset pushbutton does not reset an ESD.

#### 2.3. Priority Valve Panel

The Priority Valve Panel system provides fill sequencing to a three-bank storage system. The electronic priority system includes unloader valves, pressure gauges, and check valves. Gas is initially delivered to the 'HIGH' bank storage tank and direct vehicle fill line. After 'HIGH' bank storage tank is full gas diverts to 'MID' bank storage tank. When both the 'HIGH' and 'MID' tanks are full, gas delivers to the 'LOW' bank storage tank.

#### 2.4. Priority Panel Operation

With power supplied to the station and the ON/OFF key switch placed in the ON position, the OCS control system will sequence through each of the following operating modes.

- a) The ON/OFF key switch located on the front panel of the EPP is turned ON.
- b) The EPP is not faulted.
- c) The High Bank Pressure is less than the RESET PRESSURE setpoint in the EPP.

- d) The compressor fills High Bank until the pressure becomes greater than the SWITCH PRESSURE setpoint in the EPP and opens the Mid Bank Valve.
- e) The compressor fills Mid Bank until the pressure becomes greater than the SWITCH PRESSURE setpoint in the EPP and opens the Low Bank Valve.
- f) The compressor fills Low Bank until the Final pressure is achieved.

#### 2.5. Faulted

During any of the modes of operations, the control system may detect a shutdown condition and the controller will be placed in FAULTED mode. The fault code and type of alarm are displayed on the OCS Alarm Screen.

## 3. OPERATOR SCREENS

The controllers contain operator screens that allow the User and Alarm screen numbers to be read. The following is a definition of the two types of screens:

User Screen – These screens display the Priority CNG process. The operator can switch between screens by using the global keys or by using the NEXT (UP) and PREVIOUS (DOWN) touch keys on the controller.

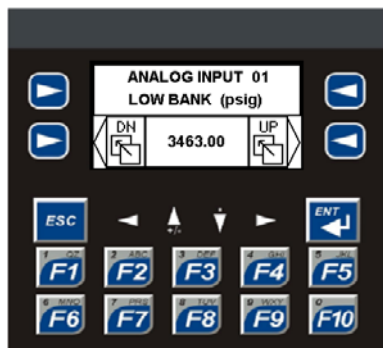
MAIN – SCREEN #1



The F7 key forces the “MAIN” screen to display. The Main Screen shows the Valve Status and the three bank pressures. Lamps are WHITE when OFF (inactive), and BLACK when ON (active).

ANALOG MONITOR – SCREENS #2 – 5

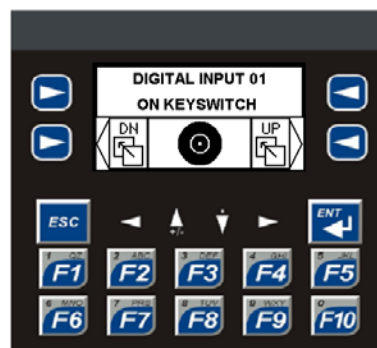
AI01 to AI04



The Analog Inputs monitor in engineering units. The inputs are configured 0 to 20 mA signal = 0 to 32000 count. The count is

scaled and displayed to their respective engineering units. Refer to ANGI P&ID drawings for proper transducer scaling.

DIGITAL INPUTS - SCREENS #6 - 12  
IO1 to IO8



This screen monitors the Digital Inputs. Input Lamps are WHITE when OFF (inactive), and BLACK when ON (active). Refer to section “Digital Input Setup” for configuration settings.

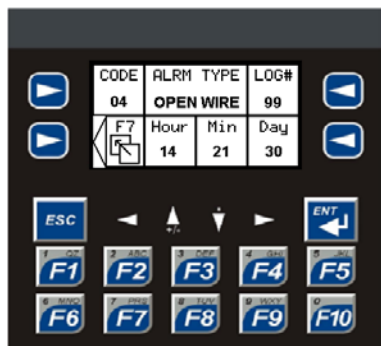
DIGITAL OUPUTS SCREEN #14 - 19  
Q01 to Q24



This screen monitors the Digital Outputs. Output Lamps are WHITE when OFF (inactive), and BLACK when ON (active).

## 4. ALARM LOG SCREEN

Access the Alarm Log Screen by pressing F8 Function key. The Alarm Log places a time and date stamp to each log entry.



The last 100 alarms are logged and stored. The information on the Alarm Log screen is as follows:

**ALARM:** This displays the current alarm log code. The following table lists the Alarms;

| ALARM   |                           |
|---------|---------------------------|
| CODE    | DESCRIPTION               |
| 1 - 4   | Analog Inputs AI01 – AI04 |
| 46 – 48 | Digital Inputs IO6 – IO8  |
| 71 – 78 | CcCAN Nodes 1 – 8         |
| 81 – 88 | Ethernet Nodes 1 - 8      |

**ALARM #:** The alarm log number identifies which of the last 100 alarms is being viewed.

**UP:** Increase the Alarm Log Number by pressing the F1 key. When the Alarm Log Number reaches 100, it will advance the Alarm Log Number to 1.

**DOWN:** Decrease the Alarm Log Number by pressing the F2 key. When the Alarm Log Number reaches 1, it will revert back to Alarm Log Number 99.

**TYPE:** The alarm type identifies which condition the alarm was activated. The following table lists the Types of Alarms;

| TYPES of ALARMS |                           |
|-----------------|---------------------------|
| CODE            | DESCRIPTION               |
| 1               | Broken Wire (Analog)      |
| 2               | Low Signal Alarm (Analog) |

|   |                            |
|---|----------------------------|
| 5 | High Signal Alarm (Analog) |
| 6 | Input Tripped (Digital)    |

## 5. FAULT SCREENS

These screens are forced to display faults generated in ladder logic. Follow the screen instructions to acknowledge and clear alarms.



The screen is annunciated when a machine fault occurs. A shutdown condition places the machine in FAULT mode. The fault is displayed as long as the fault condition exists. The description for the fault and type of fault is displayed. The information on the Machine Fault screen is as follows:

**FAULT:** This displays the active machine fault. The following table lists the Faults;

| MACHINE FAULT |                           |
|---------------|---------------------------|
| CODE          | DESCRIPTION               |
| 1 - 4         | Analog Inputs AI01 – AI04 |
| 46 – 48       | Digital Inputs IO6 – IO8  |
| 71 – 78       | CcCAN Nodes 1 – 8         |
| 81 – 88       | Ethernet Nodes 1 - 8      |

**TYPE:** A number of digital inputs and analog transducers are monitored by the control system. The control system determines the type of fault associated with the analog or digital input. The following table lists the types of faults.

| FAULT TYPES |                            |
|-------------|----------------------------|
| CODE        | DESCRIPTION                |
| 0           | No Fault                   |
| 1           | Broken Wire (Analog)       |
| 2           | Low Signal Alarm (Analog)  |
| 5           | High Signal Alarm (Analog) |
| 6           | Input Tripped (Digital)    |



## **ELECTRONIC PRIORITY PANEL (EPP) XLE - OCS Control**

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RESET: Activate the RESET Key Switch to clear the fault.

### **6. TROUBLESHOOTING**

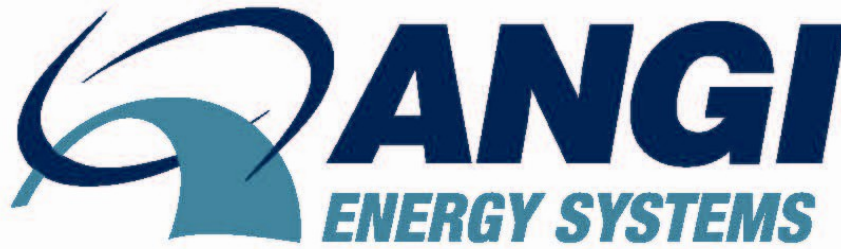
#### **Faulted Conditions (General Note)**

The transducer faults are analog fault conditions and must be verified with pressure gauge or separate test device prior to carrying out any mechanical repairs. This is to insure that the fault indicated is due to the mechanical equipment not the monitoring system.

The ESD and Site Shutdowns are digital fault conditions. Check the Master Controller (UCP or MCP) to determine the location of the ESD or Site fault condition.

A. If the fault can be verified without the unit running, do so. Correct the fault if needed.

B. Clear the fault code using the FAULT RESET key switch.



**BPR 5**

**TESCOM  
REG-BACK PRES SAE-16 TESCOM 200-4500#  
SPRING RANGE 303SS 6000#MAWP  
54-2325D116S-XXX**

**ANGI PART NUMBER-  
990-07344**



# 54-2300 Series

## Regulators - Relief / Backpressure

D54231641X012

### Specifications

For other materials or modifications, please consult TESCO.

#### OPERATING PARAMETERS

Pressure rating per criteria of ANSI/ASME B31.3

##### Maximum Inlet Pressure

**Spring and Dome Loaded:** 5000 psig / 345 bar

**Air Actuated:** 10,000 psig / 690 bar

##### Control Pressure Ranges

1000, 1500, 2500, 3500, 5000 and 10,000 psig

69.0, 103, 172, 241, 345 and 690 bar

##### Design Proof Pressure

150% of maximum rated

##### Leakage

2 drops/min at 150 S.U.S. at 2500 psig / 172 bar

##### Operating Temperature (media)<sup>1</sup>

-40°F to 165°F / -40°C to 74°C

##### Flow Capacity

$C_v = 1.6$

#### MEDIA CONTACT MATERIALS

##### Body

303 or 316 Stainless Steel

##### Seat, Poppet and Sensor

17-4 PH Stainless Steel

##### O-Rings

Buna-N, Viton®, Ethylene Propylene or Polyurethane

##### Back-up Rings

PTFE

##### Bonnet (Spring load only)

303 Stainless Steel

##### Remaining Parts

300 Stainless Steel

#### OTHER

##### Cleaning

CGA 4.1 and ASTM G93

##### Weight

**Spring and Dome Loaded:** 15 lbs / 6.8 kg

**Air Actuated:** 30 lbs / 13.6 kg

1. Operating temperature range dependent on o-ring material.

Teflon® and Viton® are registered trademarks of E.I. du Pont de Nemours and Company.



TESCOM 54-2300 Series backpressure hydraulic regulator is capable of flows from 5-50 GPM and is available in air load for use with the TESCO ER3000 Electropneumatic Controller.

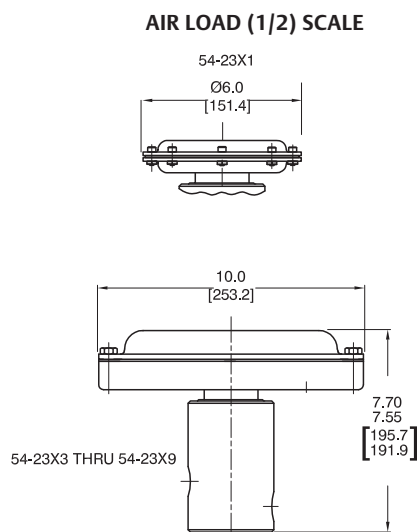
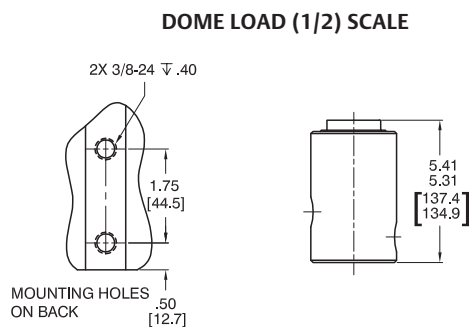
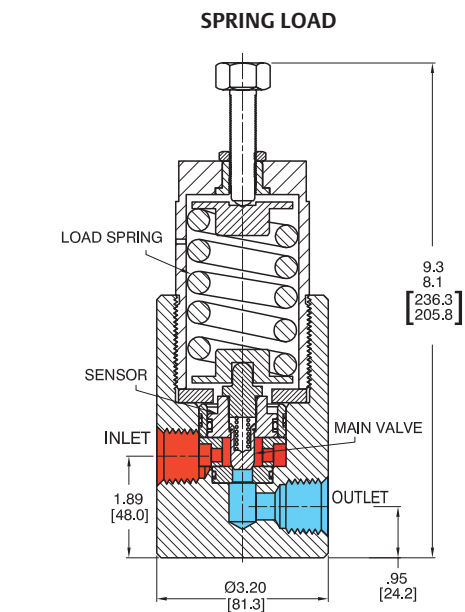
### Applications

- Hydraulic test stands
- Process control

### Features and Benefits

- Wear rings available for non-lubricating media
- Control pressure up to 10,000 psig / 690 bar
- Flow Capacity  $C_v = 1.6$
- Excellent crack-to-reseat ratio
- Hardened metal-to-metal seats for heavy duty service
- Choice of spring, dome and air actuated loading
- Standard side mounting holes

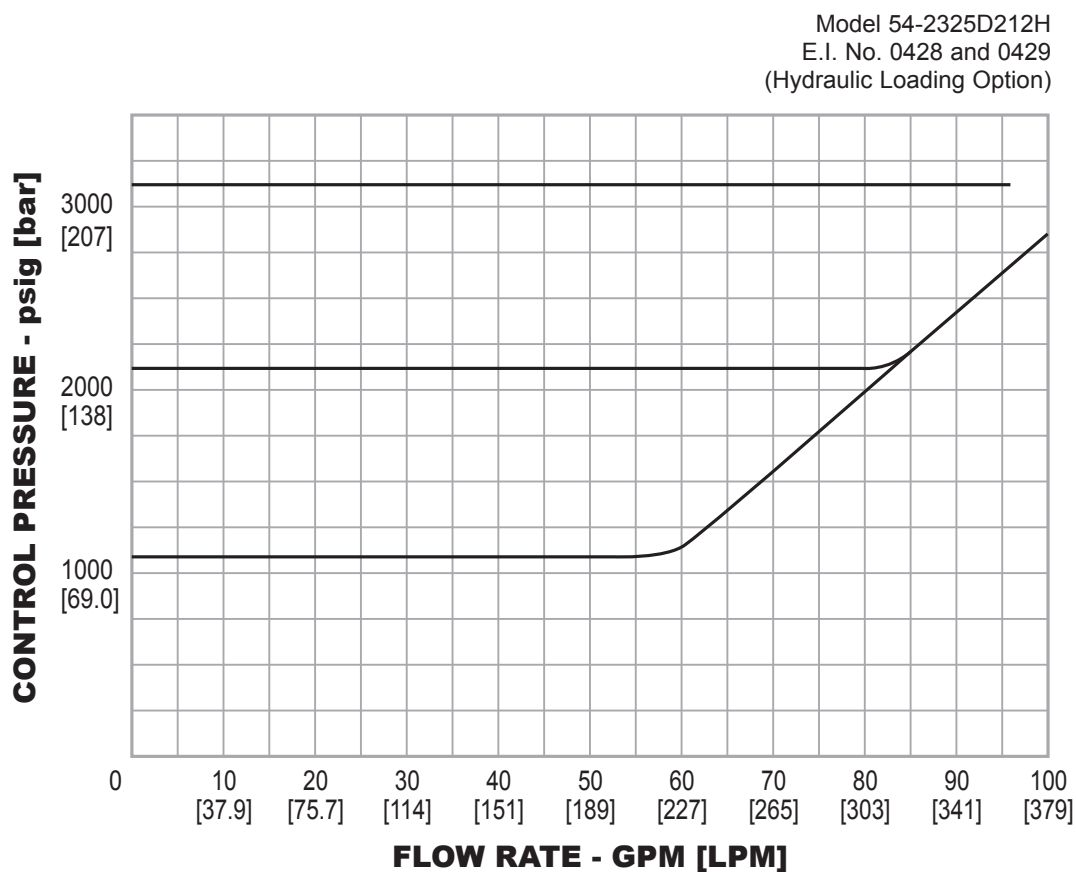
## 54-2300 Series Regulator Drawing



All dimensions are reference & nominal  
Metric [millimeter] equivalents are in brackets

## 54-2300 Series Regulator Flow Chart

For more information on how to read flow curves, please refer to the Flow Curves and Calculations document (debul2007x012) in the TESCOM catalog or on [www.tescom.com](http://www.tescom.com).



## 54-2300 Series Regulator Part Number Selector

*Repair Kits, Accessories & Modifications may be available for this product. Please contact TESCOM for more information.*

*Example for selecting a part number:*

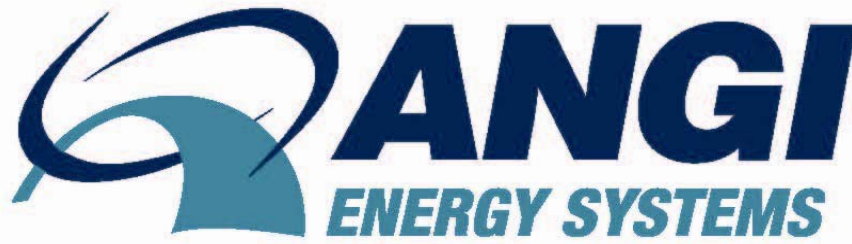
| 54-23           | 2                       | 1                                                                                                   | T                      |                    |                      |                                  | 2                             | 12                    | S                                 |
|-----------------|-------------------------|-----------------------------------------------------------------------------------------------------|------------------------|--------------------|----------------------|----------------------------------|-------------------------------|-----------------------|-----------------------------------|
| BASIC<br>SERIES | BODY<br>MATERIAL        | CONTROL PRESSURE<br>RANGES                                                                          | SOFT GOODS MATERIAL    |                    |                      |                                  | PORT<br>TYPE                  | PORT<br>SIZE          | LOADING<br>METHOD                 |
|                 |                         |                                                                                                     | O-RINGS<br>DYNAMIC     | STATIC             | SEAT                 | TEMPERATURE<br>(MEDIA ONLY)      |                               |                       |                                   |
| 54-23           | 2 – 303 Stainless Steel | 0 – 20-1000 psig<br>1.4-69.0 bar<br>(spring only)                                                   | D – Buna-N             | Buna-N             | 17-4 Stainless Steel | -40°F to 165°F<br>-40°C to 74°C  | 1 – SAE<br>2 – NPTF           | 8 – 1/2"<br>12 – 3/4" | S – Spring<br>H – Dome<br>A – Air |
|                 | 6 – 316 Stainless Steel | 1 – 20-1500 psig<br>1.4-103 bar<br>(spring and air only)                                            | T – Viton®             | Viton®             | 17-4 Stainless Steel | -15°F to 300°F<br>-26°C to 149°C |                               |                       |                                   |
|                 |                         | 3 – 50-3500 psig<br>3.4-241 bar<br>(spring only)<br>50-2500 psig<br>3.4-172 bar<br>(air only 30:1*) | U – Polyurethane       | Polyurethane       | 17-4 Stainless Steel | -15°F to 125°F<br>-26°C to 52°C  |                               |                       |                                   |
|                 |                         | 5 – 200-5000 psig<br>13.8-345 bar<br>(spring and dome 1:1 and air 75:1)                             | Z – Ethylene Propylene | Ethylene Propylene | 17-4 Stainless Steel | -40°F to 225°F<br>-40°C to 107°C |                               |                       |                                   |
|                 |                         | 9 – 250-10,000 psig<br>17.2-690 bar<br>(air only 125:1*)                                            |                        |                    |                      |                                  |                               |                       |                                   |
|                 |                         |                                                                                                     |                        |                    |                      |                                  | *Ratio is for reference only. |                       |                                   |



**WARNING!** Do not attempt to select, install, use or maintain this product until you have read and fully understood the *TESCOM Safety, Installation and Operation Precautions*.

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**BV 7**

HOKE  
6610M4Y

PURGE VALVE – ¼" MNPT 6000 PSI STAINLESS STEEL

ANGI PART NUMBER - 330-07281

NO REBUILD KIT AVAILABLE

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**Purpose:**

- Hoke 6600 Series Bleed Valves allow for quick, easy manual bleed off of system pressure

**Typical Applications:**

- Air, Hydraulic Systems or **Natural Gas**

**Technical Data: **6610** 6660, 6670, and 6680 Series Bleed Valves:**

- **Maximum Operating Pressure: 6000 PSIG @ 70°F (414 Bar @ 21°C)**
- **Operating Temperature Range: -40° to 600°F (-40° to 316°C)**
- **End Connections: 1/4, 3/8, 1/2 inch Gyrolok®**

**Technical Data: 6631 Series Bleed Valves:**

- Maximum Operating Pressure: 5000 PSIG @ 70°F (345 Bar @ 21°C)
- Operating Temperature Range: -20° to 425°F (-29° to 218°C)
- Orifice: .125 in. (3.2mm)
- End Connections: 1/4" NPT, 1/4" Tube Stub

**Features:**

- Compact Installation
- 316 Stainless Steel Construction
- Straight, Union, Elbow or Tee Flow Configurations
- Integral Tube Ends

**Benefits:**

- Safe
- Reliable
- Gyrolok® Fitting Connections Eliminate Pipe Thread Leak Paths

**Operation Instructions: (For all but the 6631 Series Valves)**

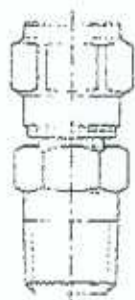
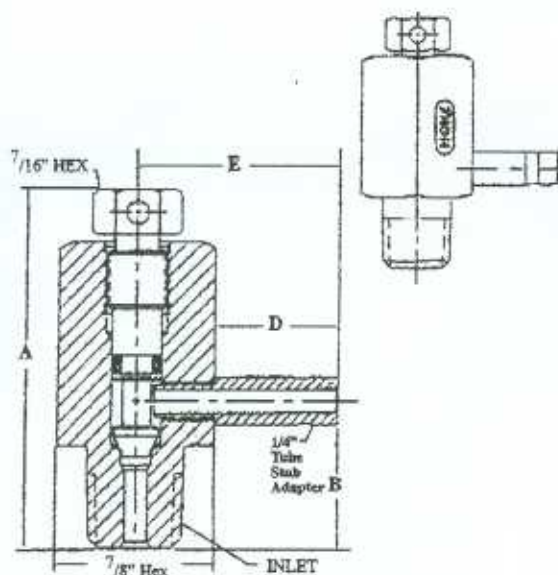
- Valve is operated by turning the bleed port nut with a wrench. Use appropriate back-up wrench to hold body, while turning bleed nut.
- As bleed nut is turned, pressure forces ball off seat. Pressure is vented through a hole drilled in the nut, angled back toward the body of the valve. Make sure flow is directed away from user.
- Those using the valves should wear protective clothing, especially goggles.
- No attempt should be made to repair or dismantle the valve.



# 6600 SERIES BLEED VALVE

## Part Number/Ordering Chart:

| Series Designation      | Configuration      | End Type               | End Size         | Material       |
|-------------------------|--------------------|------------------------|------------------|----------------|
| <b>66 - Bleed Valve</b> | <b>10-Straight</b> | G-Gyrolok              | <b>4-1/4 in.</b> | <b>Y-316SS</b> |
|                         | 31-Directed        | H-Male NPT x Tube Stub | 6-3/8 in.        |                |
|                         | 60-Elbow           | <b>M-Male NPT</b>      | 8-1/2 in.        |                |
|                         | 70-Union           |                        |                  |                |
|                         | 80-Tee             |                        |                  |                |



### 6631 Series Bleed Valves:

Hoke's 6631 Bleed Valve allows the user to direct the bled fluid as desired. To operate simply turn the 7/16" nut with a wrench or the optional loose fit handle, part number 96706-103.

| Part Number | Inlet        | A (open)     | B            | D            |              |
|-------------|--------------|--------------|--------------|--------------|--------------|
| 6631H4Y     | 1/4 Male NPT | 2 (51mm)     | 3/4 (19mm)   | 11/16 (17mm) | 1 1/8 (29mm) |
| 6631H84Y    | 1/2 Male NPT | 2 1/8 (54mm) | 29/32 (23mm) | 11/16 (17mm) | 1 1/8 (29mm) |

### 6610 6660, 6670, And 6680 Series Bleed Valves:

These Hoke Valves come in a variety of configurations including Straight, Elbow, Union, and Tee. See operating instructions and technical data on front cover.

| Part Number    | P Thread NPT | A Open         | B' Hex | C Wrench Flat |
|----------------|--------------|----------------|--------|---------------|
| <b>6610M4Y</b> | 1/4          | 1 17/32 (39mm) | 5/8    | 9/16          |
| 6610MGY        | 3/8          | 1 19/32 (40mm) | 5/8    | 11/16         |
| 6610M8Y        | 1/2          | 1 13/16 (46mm) | 5/8    | 7/8           |

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



**BV 8**

HOKE  
6610MS4Y

PURGE VALVE - 7/16 - 20" MSAE 6000 PSI  
STAINLESS STEEL

ANGI PART NUMBER - 330-07312

NO REBUILD KIT AVAILABLE

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**Purpose:**

- Hoke 6600 Series Bleed Valves allow for quick, easy manual bleed off of system pressure

**Typical Applications:**

- Air, Hydraulic Systems or **Natural Gas**

**Technical Data: 6610, 6660, 6670, and 6680 Series Bleed Valves:**

- **Maximum Operating Pressure: 6000 PSIG @ 70°F (414 Bar @ 21°C)**
- **Operating Temperature Range: -40° to 600°F (-40° to 316°C)**
- **End Connections: 1/4, 3/8, 1/2 inch Gyrolok®** 

**Technical Data: 6631 Series Bleed Valves:**

- Maximum Operating Pressure: 5000 PSIG @ 70°F (345 Bar @ 21°C)
- Operating Temperature Range: -20° to 425°F (-29° to 218°C)
- Orifice: .125 in. (3.2mm)
- End Connections: 1/4" NPT, 1/4" Tube Stub

**Features:**

- Compact Installation
- 316 Stainless Steel Construction
- Straight, Union, Elbow or Tee Flow Configurations
- Integral Tube Ends

**Benefits:**

- Safe
- Reliable
- Gyrolok® Fitting Connections Eliminate Pipe Thread Leak Paths

**Operation Instructions: (For all but the 6631 Series Valves)**

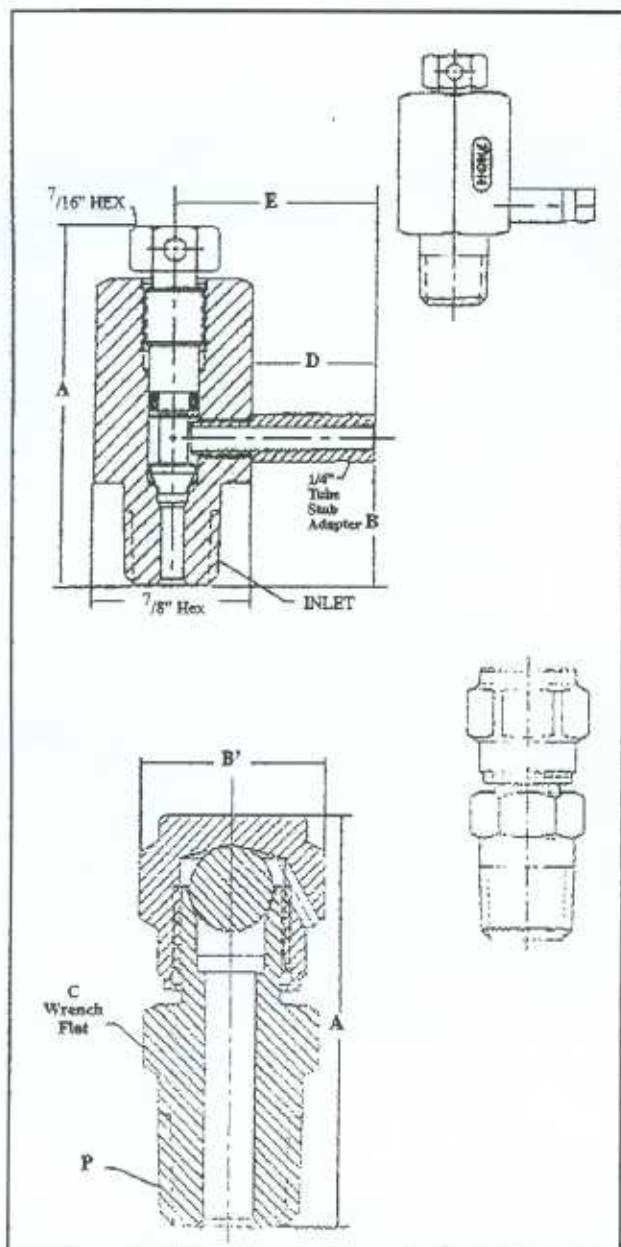
- Valve is operated by turning the bleed port nut with a wrench. Use appropriate back-up wrench to hold body, while turning bleed nut.
- As bleed nut is turned, pressure forces ball off seat. Pressure is vented through a hole drilled in the nut, angled back toward the body of the valve. Make sure flow is directed away from user.
- Those using the valves should wear protective clothing, especially goggles.
- No attempt should be made to repair or dismantle the valve.



# 6600 SERIES BLEED VALVE

## Part Number/Ordering Chart:

| Series Designation      | Configuration      | End Type               | End Size         | Material       |
|-------------------------|--------------------|------------------------|------------------|----------------|
| <b>66 - Bleed Valve</b> | <b>10-Straight</b> | G-Gyrolok              | <b>4-1/4 in.</b> | <b>Y-316SS</b> |
|                         | 31-Directed        | H-Male NPT x Tube Stub | 6-3/8 in.        |                |
|                         | 60-Elbow           | <b>M-Male NPT</b>      | 8-1/2 in.        |                |
|                         | 70-Union           |                        |                  |                |
|                         | 80-Tee             |                        |                  |                |



### 6631 Series Bleed Valves:

Hoke's 6631 Bleed Valve allows the user to direct the bled fluid as desired. To operate simply turn the 7/16" nut with a wrench or the optional loose fit handle, part number 96706-103.

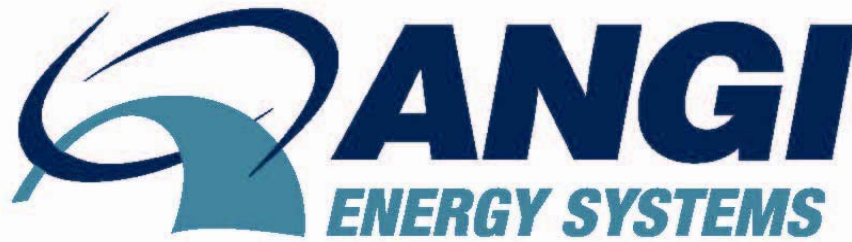
| Part Number | Inlet        | A (open)     | B            | D            | W            |
|-------------|--------------|--------------|--------------|--------------|--------------|
| 6631H4Y     | 1/4 Male NPT | 2 (51mm)     | 3/4 (19mm)   | 11/16 (17mm) | 1 1/8 (29mm) |
| 6631H84Y    | 1/2 Male NPT | 2 1/8 (54mm) | 29/32 (23mm) | 11/16 (17mm) | 1 1/8 (29mm) |

### 6610 6660, 6670, And 6680 Series Bleed Valves:

These Hoke Valves come in a variety of configurations including Straight, Elbow, Union, and Tee. See operating instructions and technical data on front cover.

| Part Number    | P Thread NPT | A Open         | B' Hex | C Wrench Flat |
|----------------|--------------|----------------|--------|---------------|
| <b>6610M4Y</b> | 1/4          | 1 17/32 (39mm) | 5/8    | 9/16          |
| 6610MGY        | 3/8          | 1 19/32 (40mm) | 5/8    | 11/16         |
| 6610M8Y        | 1/2          | 1 13/16 (46mm) | 5/8    | 7/8           |

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



**CV 2**

HOKE

6133M4Y3

1/4" MNPT CHECK VALVE 6000 PSI,  
2 PSI CRACKING PRESSURE SPRING

ANGI PART NUMBER 336-02419

REBUILD KIT ASSY - 804-06816

BALL CHECK VALVE 1/4 SS 6130 SERIES – 339-06818

O’RING CHECK VALVE 6130 SERIES – 710-07377

GASKET CHECK VALVE 6130 & 6230 SERIES – 260-06819

SPRING CHECK VALVE 6100 & 6230 SERIES SS & BRASS 2 PSI –  
650-06820

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# Check Valves—Ball and Poppet Designs 6100—6200 Series



6133G4Y

## APPLICATIONS:

- Prevents reversed flow to protect solenoids, regulators and pumps
- Locks pressure in hydraulic cylinders
- Low pressure inline relief valve
- Vent valve to purge a system

## Maximum Operating Pressure:

Brass Valves: 3000 PSIG @ 70°F (211 Kg/Cm<sup>2</sup> @ 21°C)

SS Valves: 6000 PSIG @ 70°F (423Kg/Cm<sup>2</sup> @ 21°C)

## Operating Temperature Range:

Buna N O-ring: -40° to 200°F (-40° to 93°C)

Viton O-ring: -20° to 350°F (-29° to 177°C)

Cracking Pressure Standard: 2 PSI (.14 Kg/Cm<sup>2</sup>)

**Orifice Sizes:** .187" (4.75mm), .422" (10.7mm)

**Cv Factor:** 0.3, 2.4

## MATERIALS OF CONSTRUCTION

|                | Ball Type    |              |        | Poppet Type    |
|----------------|--------------|--------------|--------|----------------|
|                | Brass Valves | 316SS Valves | Monel  | 316SS          |
| Body           | Brass        | 316SS        | Monel  | 316SS          |
| Ball or Poppet | 302SS        | 316SS        | Monel  | 316SS          |
| Spring         | 302SS        | 316SS        | Monel  | 316SS          |
| O-ring seat    | Buna N       | Viton        | Viton  | Viton Buna N*  |
| Gasket (Body)  | Mylar        | Teflon       | Teflon | Teflon Buna N* |

\*For poppet check valves with 3/8 and 1/2 NPT female connections.



6253F8Y

## BALL CHECK VALVES

| A & B Connections          | ORDER BY NUMBER |         |               |         |
|----------------------------|-----------------|---------|---------------|---------|
|                            | Brass Valves    | Monel   | 316 SS Valves | Orifice |
| 1/8 NPT Female             | 6113F2B         | —       | 6133F2Y       | .187    |
| 1/8 NPT Male               | 6113M2B         | —       | 6133M2Y       | .187    |
| 1/4 NPT Female             | 6113F4B         | —       | 6133F4Y       | .187    |
| 1/4 NPT Male               | 6113M4B         | —       | 6133M4Y       | .187    |
| 1/4 Gyrolok                | 6113G4B         | 6133G4M | 6133G4Y       | .187    |
| 3/8 Gyrolok                | 6113G6B         | 6133G6M | 6133G6Y       | .187    |
| 1/4 NPT Male x 1/4 Gyrolok | 6113H4B         | —       | —             | .187    |
| 6MM Gyrolok                | —               | —       | 6133G6Y/MM    | .187    |

## POPPET CHECK VALVES

| A & B Connections | ORDER BY NUMBER |         |
|-------------------|-----------------|---------|
|                   | 316 SS Valves   | Orifice |
| 1/4 NPT Female    | 6233F4Y         | .187    |
| 1/4 NPT Male      | 6233M4Y         | .187    |
| 1/4 Gyrolok       | 6233G4Y         | .187    |
| 3/8 Gyrolok       | 6233G6Y         | .187    |
| 1/2 NPT Female    | 6253F8Y         | .422    |
| 1/2 Gyrolok       | 6253G8Y         | .422    |

## OTHER DIFFERENTIAL CRACKING PRESSURES

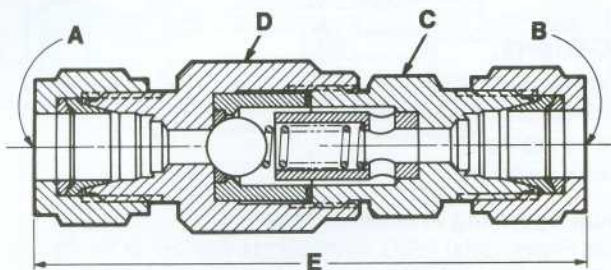
All check valves except 3/8 and 1/2 NPT female models can be furnished with other than 2 PSI cracking pressures. To order, change the fourth digit (3) of the desired valve part number as follows: Example: 6115G4B would have 10 PSI cracking pressure.

**Cracking Pressure** { 1/3 PSI  
10 PSI  
25 PSI

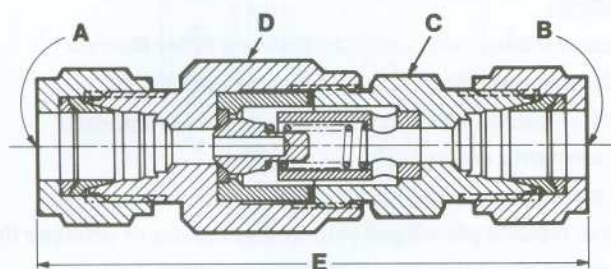
**Fourth Digit** { "1"  
"5"  
"6"

## FEATURES:

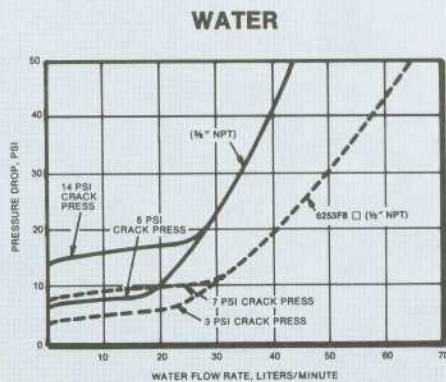
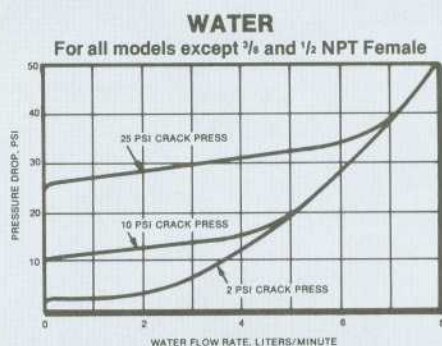
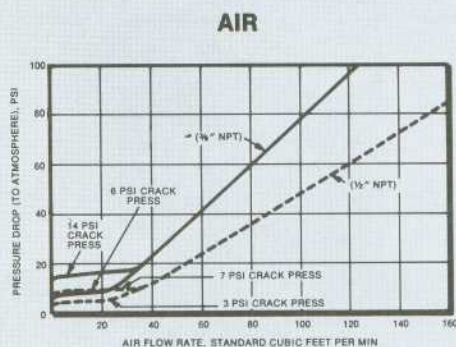
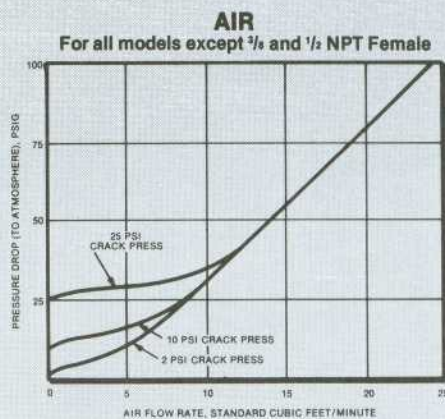
- O-ring seat provides leak-tight shut-off.
- Internal design guides flow around or inside spring, not through coils, when valve is open.
- All models are tested in production to assure a leak-tight body joint and seat.
- Ball & Poppet designs are available as standard.
- Ball type provides effective leak-tight closure with minimum flow resistance.
- Poppet models provide large flows with a minimum of chatter and fluctuation.
- Valves are available with various cracking pressures, from 1/3 to 25 PSI.
- 2-piece body permits interchangeability of end connections.



**6133G4Y  
BALL TYPE**

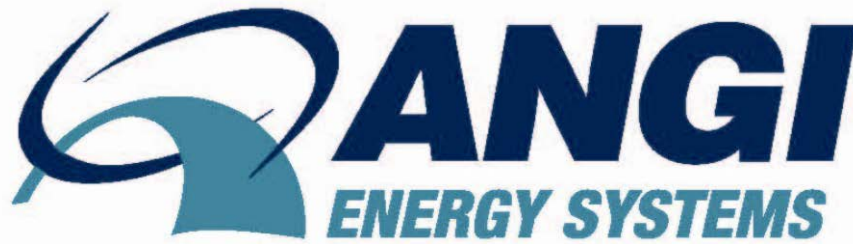


**6233G4Y  
POPPET TYPE**



## DIMENSIONS

| Type   | A & B Connections |      | C (Hex) | D (Hex) | E     |
|--------|-------------------|------|---------|---------|-------|
| Ball   | 1/8 NPT Female    | mm   | 17      | 19      | 60    |
|        |                   | inch | 11/16   | 3/4     | 2 3/8 |
|        | 1/8 NPT Male      | mm   | 17      | 19      | 60    |
|        |                   | inch | 11/16   | 3/4     | 2 3/8 |
|        | 1/4 NPT Female    | mm   | 19      | 19      | 64    |
|        |                   | inch | 3/4     | 3/4     | 2 1/2 |
|        | 1/4 NPT Male      | mm   | 17      | 19      | 60    |
|        |                   | inch | 11/16   | 3/4     | 2 3/8 |
|        | 1/4 Gyrolok       | mm   | 17      | 19      | 70    |
|        |                   | inch | 11/16   | 3/4     | 2 3/4 |
| Poppet | 6MM Gyrolok       | mm   | 17      | 19      | 76    |
|        |                   | inch | 11/16   | 3/4     | 3     |
|        | 1/4 Gyrolok       | mm   | 17      | 19      | 76    |
|        |                   | inch | 11/16   | 3/4     | 3     |
|        | 3/8 Gyrolok       | mm   | 25      | 19      | 79    |
|        |                   | inch | 1       | 3/4     | 3 1/8 |
|        | 1/4 NPT Female    | mm   | 19      | 19      | 64    |
|        |                   | inch | 3/4     | 3/4     | 2 1/2 |
|        | 1/4 NPT Male      | mm   | 17      | 19      | 60    |
|        |                   | inch | 11/16   | 3/4     | 2 3/8 |
| Poppet | 1/4 Gyrolok       | mm   | 17      | 19      | 76    |
|        |                   | inch | 11/16   | 3/4     | 3     |
|        | 3/8 Gyrolok       | mm   | 25      | 19      | 79    |
|        |                   | inch | 1       | 3/4     | 3 1/8 |
|        | 1/2 Female        | mm   | 32      | 32      | 89    |
|        |                   | inch | 1 1/4   | 1 1/4   | 3 1/2 |



**CV 92**

HOKE  
CVH-080

CHECK VALVE 1 FSAE (SAE-16) 6000#  
W/20# CRACKING SPRING

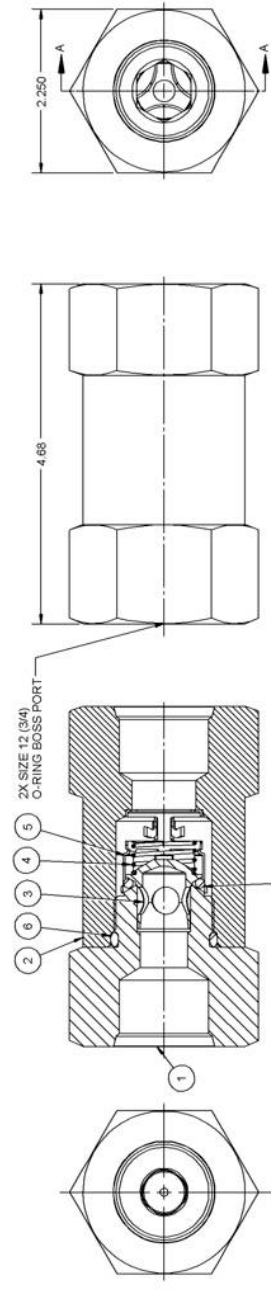
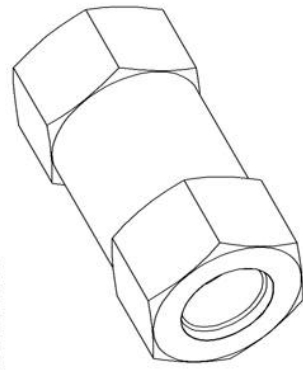
ANGI PART NUMBER – 336-07321

O’RING – 761-07418

SPRING – 650-07358



|                        |  |           |  |
|------------------------|--|-----------|--|
| CVH-080                |  | REV 1     |  |
| DESCRIPTION            |  | DATE      |  |
| RELEASED PER ECO 32598 |  | 1/12/2012 |  |
| MSS                    |  | MSS       |  |



SECTION A-A

NOTE:  
FOR ASSEMBLY, TEST & MARKING INSTRUCTIONS SEE CVH SERIES DRAWING.

| QTY. | PART NUMBER   | DESCRIPTION               | MATERIAL | ITEM NO. |
|------|---------------|---------------------------|----------|----------|
| 1    | 58-211-59     | O-RING                    | VITON    | 7        |
| 1    | 58-218-50     | O-RING                    | VITON    | 6        |
| 1    | 121348        | SPRING GUIDE, CVH (LARGE) | 316 SST  | 5        |
| 1    | 121345-20     | SPRING                    | 302 SST  | 4        |
| 1    | 121342-103    | POPPET, CVH (LARGE)       | 316 SST  | 3        |
| 1    | 121746-16-103 | BODY, FEMALE SAE          | 316 SST  | 2        |
| 1    | 121745-16-103 | END, FEMALE SAE           | 316 SST  | 1        |

|                         |  |           |                                  |
|-------------------------|--|-----------|----------------------------------|
| APPROVALS               |  | DATE      | SECTION                          |
| LJB                     |  | 1/19/2012 | SPARTANBURG SOUTH CAROLINA 29303 |
| MSS                     |  | 1/18/2012 | CHECK VALVE                      |
| KDJ                     |  | 1/19/2012 | SIZE 16 FEMALE SAE               |
| DETAILS (DATE REV ONLY) |  |           | PSI 316 SST VITON SEALS          |
| C 28968                 |  |           | CVH-080                          |
| SCALE                   |  | 1:1       | SHEET 1 OF 1                     |





**G 22**

WIKA  
50394771

0-200 PSI/BAR PRESSURE GAUGE

ANGI PART NUMBER 741-07240

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# Industrial Gauges

## Type 23X.53



Type 232.53 - Dry case  
Type 233.53 - Liquid filled case

- Stainless Steel Case & Crimp Ring
- Welded Case-to-Socket Connection
- Field Liquid-Fillable

The rugged construction of WIKAI Type 23X.53 stainless steel gauges provides resistance to the most corrosive media and environments. These gauges feature 316 stainless steel wetted parts and a 304 stainless steel case and crimped ring, and can be liquid-filled in the field.

### Standard Features

- Nominal Case Size: 2" (53 mm) **2½"** (68 mm), 4" (100 mm)
- Case Material: 304 stainless steel
- Wetted Parts: 316 SS
- Window Type & Material: 2½" Polycarbonate; 4" Acrylic
- Removable Window: No
- Dial Material: White aluminum
- Bezel Ring Type & Material: Crimp on SS polished
- Liquid Fillable Gauge: Yes
- Case-to-Socket O-ring Material: Welded
- "Other" Gaskets/O-ring Types & Materials:  
Window gasket, BUNA-N
- Pointer Material/Type: Black aluminum
- Adjustable Pointer: No
- Accuracy:  $\pm 1.5\%$  of span (2" & 2½");  
(4")  $\pm 1.0\%$  of span-ASME B40.100 Grade 1A
- Connection locations: LM (Lower Mount),  
CBM (Center Back Mount)  
& LBM (Lower Back Mount) (4" only)
- Media Operating Temperature: 212°F
- Ambient Operating Temperature: -40°F to 140°F dry;  
-4°F to 140°F glycerine case fill; -40°F to 140°F silicone  
case fill

|                             |                                                                                      |                                                                                         |         |         |                        |
|-----------------------------|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|---------|---------|------------------------|
| Type                        | 232.53                                                                               |                                                                                         |         |         |                        |
| Connection                  | LM  | CBM  |         |         |                        |
| Conn. Size                  | 1/4" NPT                                                                             |                                                                                         |         |         |                        |
| Size                        | 2 1/2"                                                                               |                                                                                         |         |         |                        |
| Pressure Scale <sup>1</sup> | PSI                                                                                  | PSI                                                                                     | PSI/BAR | PSI/KPA | PSI/KG/CM <sup>2</sup> |
| 30" Hg                      | 9768777                                                                              | 9768394                                                                                 |         |         |                        |
| 30"-0-15 PSI                |                                                                                      |                                                                                         |         |         |                        |
| 30"-0-30 PSI                | 9768769                                                                              | 9768386                                                                                 |         |         |                        |
| 30"-0-60 PSI                | 9768750                                                                              | 9768378                                                                                 |         |         |                        |
| 30"-0-100 PSI               |                                                                                      |                                                                                         |         |         |                        |
| 30"-0-160 PSI               | 9768742                                                                              | 9768360                                                                                 |         |         |                        |
| 30"-0-200 PSI               |                                                                                      |                                                                                         |         |         |                        |
| 15 PSI                      | 9768734                                                                              | 9768351                                                                                 |         |         |                        |
| 30 PSI                      | 9768726                                                                              | 9768343                                                                                 |         |         |                        |
| 60 PSI                      | 9768718                                                                              | 9768335                                                                                 | 8992848 | 8993089 | 8992962                |
| 100 PSI                     | 9768700                                                                              | 9768327                                                                                 | 8992856 | 8993097 | 8992970                |
| 160 PSI                     | 9768696                                                                              | 9768319                                                                                 | 8992865 | 8993101 | 8992988                |
| 200 PSI                     | 9768688                                                                              | 9768300                                                                                 | 8992873 | 8993119 | 8992996                |
| 300 PSI                     | 9768670                                                                              | 9768297                                                                                 | 8992881 | 8993127 | 8993004                |
| 400 PSI                     | 9768661                                                                              | 9768289                                                                                 |         |         |                        |
| 600 PSI                     | 9768653                                                                              | 9768270                                                                                 | 9779685 | 9779693 |                        |
| 800 PSI                     |                                                                                      |                                                                                         |         |         |                        |
| 1,000 PSI                   | 9768645                                                                              | 9768262                                                                                 | 8992899 | 8993135 | 8993012                |
| 1,500 PSI                   | 9768637                                                                              | 9768254                                                                                 | 8992903 | 8993144 | 8993020                |
| 2,000 PSI                   | 9768629                                                                              | 9768246                                                                                 | 8992911 | 8993152 | 8993038                |
| 3,000 PSI                   | 9768610                                                                              | 9768238                                                                                 | 8992929 | 8993160 | 8993046                |
| 5,000 PSI                   | 9768602                                                                              | 9768220                                                                                 | 8992937 | 8993178 | 8993055                |
| 6,000 PSI                   |                                                                                      | 8993208                                                                                 | 8992945 | 8993186 | 8993063                |
| 10,000 PSI                  | 9768599                                                                              | 9768211                                                                                 | 8992954 | 8993195 | 8993071                |
| 15,000 PSI                  |                                                                                      | 9779715                                                                                 | 9776715 |         | 9779731                |

<sup>1</sup>PSI/BAR<sup>2</sup> denotes dual scale; PSI outside in black, BAR inside in red; <sup>2</sup>PSI/KPA<sup>3</sup> denotes dual scale; PSI outside in black, KPA inside in red; <sup>3</sup>PSI/KG/CM<sup>2</sup> denotes dual scale; PSI outside in black, KG/CM<sup>2</sup> inside in red. Note: Vacuum scale: 30" Hg outside in black; 760 mm Hg inside in red.

Note: For options not shown - consult your WIKAI Distributor or the Factory.

### Data sheet: 23X.53

For liquid filled gauges, add "-B29" to part numbers above for 2½" size or "-B34" for 4" size.

Items shown with part numbers indicate readily available standard WIKAI products. Items shown without part numbers are available on special order.

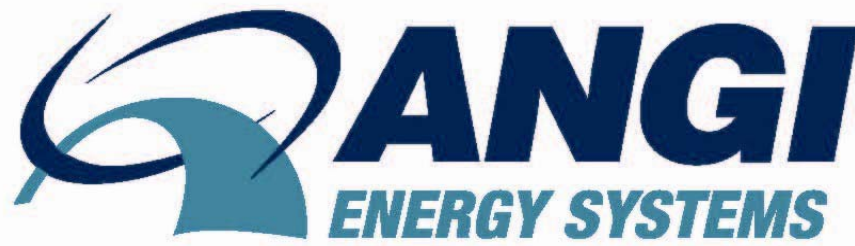
#### Available Options:

- "Dampened Movement" Option: Yes,  
(N/A on 2½" CBM or 2" LM/CBM) & LBM
- U-Clamp Bracket: Yes (CBM only)
- Front Flange: Yes (CBM & LBM only)
- Rear Flange: Yes (LM, CBM & LBM)
- Restrictor: Yes
- Safety Glass Window: No
- Instrument Glass Window (flat glass): No
- Drag Pointer (maximum reading indicator): Yes
- Cleaned for Use in Oxygen Service: Yes
- Panel Mount Kit: Yes (see front flange or u-clamp option)
- Magnetic or Inductive Contact Switches: No
- Receiver Gauge Scales: Yes
- Special Connection: Limited to wrench flat area

| Type           | 232.53- liquid fillable                                                              |                                                                                      |                                                                                       |
|----------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Connection     | LM  | LM  | LBM  |
| Conn. Size     | 1/4" NPT                                                                             |                                                                                      | 1/2" NPT                                                                              |
| Size           | 4"                                                                                   |                                                                                      |                                                                                       |
| Pressure Scale | PSI                                                                                  | PSI                                                                                  | PSI                                                                                   |
| 30" Hg         | 9767576                                                                              | 9768459                                                                              | 9737057                                                                               |
| 30"-0-15 PSI   | 9737910                                                                              | 9768467                                                                              | 9737065                                                                               |
| 30"-0-30 PSI   | 9767398                                                                              | 9768475                                                                              | 9737073                                                                               |
| 30"-0-60 PSI   | 9767401                                                                              | 9768483                                                                              | 9737081                                                                               |
| 30"-0-100 PSI  | 9737898                                                                              | 9737880                                                                              | 9737090                                                                               |
| 30"-0-160 PSI  | 9767410                                                                              | 9768491                                                                              | 9737103                                                                               |
| 30"-0-200 PSI  | 9737901                                                                              | 9768505                                                                              | 9737111                                                                               |
| 30"-0-300 PSI  | 4260147                                                                              |                                                                                      |                                                                                       |
| 30"-0-400 PSI  | 4260155                                                                              |                                                                                      |                                                                                       |
| 15 PSI         | 9767428                                                                              | 9768513                                                                              | 9737120                                                                               |
| 30 PSI         | 9767436                                                                              | 9768521                                                                              | 9737138                                                                               |
| 60 PSI         | 9767444                                                                              | 9768530                                                                              | 9737146                                                                               |
| 100 PSI        | 9767452                                                                              | 9768548                                                                              | 9737154                                                                               |
| 160 PSI        | 9767460                                                                              | 9768556                                                                              | 9737162                                                                               |
| 200 PSI        | 9767479                                                                              | 9768564                                                                              | 9737170                                                                               |
| 300 PSI        | 9767487                                                                              | 9768572                                                                              | 9737189                                                                               |
| 400 PSI        | 9767495                                                                              | 9768580                                                                              | 9737197                                                                               |
| 600 PSI        | 9767509                                                                              | 9768963                                                                              | 9737200                                                                               |
| 800 PSI        |                                                                                      |                                                                                      | 9737219                                                                               |
| 1,000 PSI      | 9767517                                                                              | 9768858                                                                              | 9737227                                                                               |
| 1,500 PSI      |                                                                                      | 9768866                                                                              | 9737235                                                                               |
| 2,000 PSI      |                                                                                      | 9768807                                                                              | 9737243                                                                               |
| 3,000 PSI      |                                                                                      | 9768874                                                                              | 9737251                                                                               |
| 5,000 PSI      |                                                                                      | 9768823                                                                              | 9737260                                                                               |
| 10,000 PSI     |                                                                                      | 9768831                                                                              | 9737278                                                                               |
| 15,000 PSI     |                                                                                      | 9768840                                                                              | 9737286                                                                               |

| Type           | 233.53- glycerine filled                                                              |                                                                                        |                                                                                         |                                                                                         |          |
|----------------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|----------|
| Connection     | LM  | LM  | LBM  | CBM  |          |
| Conn. Size     | 1/4" NPT                                                                              |                                                                                        | 1/2" NPT                                                                                |                                                                                         | 1/4" NPT |
| Size           | 2 1/2"                                                                                | 4"                                                                                     | 4"                                                                                      |                                                                                         | 2 1/2"   |
| Pressure Scale | PSI                                                                                   | PSI                                                                                    | PSI                                                                                     | PSI                                                                                     | PSI      |
| 30" Hg         | 9833646                                                                               | 9833124                                                                                | 9833328                                                                                 | 9831504                                                                                 | 9833310  |
| 30"-0-15 PSI   |                                                                                       | 9831775                                                                                | 9833336                                                                                 | 9831512                                                                                 |          |
| 30"-0-30 PSI   | 9833638                                                                               | 9832993                                                                                | 9833345                                                                                 | 9831520                                                                                 | 9833302  |
| 30"-0-60 PSI   | 9833620                                                                               | 9833000                                                                                | 9833353                                                                                 | 9831538                                                                                 | 9833298  |
| 30"-0-100 PSI  |                                                                                       | 9831759                                                                                | 9831741                                                                                 | 9831546                                                                                 |          |
| 30"-0-160 PSI  | 9833612                                                                               | 9833018                                                                                | 9833361                                                                                 | 9831555                                                                                 | 9833280  |
| 30"-0-200 PSI  |                                                                                       | 9831767                                                                                | 9833379                                                                                 | 9831563                                                                                 |          |
| 30"-0-300 PSI  |                                                                                       |                                                                                        |                                                                                         |                                                                                         |          |
| 30"-0-400 PSI  |                                                                                       |                                                                                        |                                                                                         |                                                                                         |          |
| 15 PSI         | 9833604                                                                               | 9833026                                                                                | 9833387                                                                                 | 9831571                                                                                 | 9833272  |
| 30 PSI         | 9833590                                                                               | 9833035                                                                                | 9833395                                                                                 | 9831589                                                                                 | 9833264  |
| 60 PSI         | 9833582                                                                               | 9833043                                                                                | 9833409                                                                                 | 9831597                                                                                 | 9833255  |
| 100 PSI        | 9833574                                                                               | 9833051                                                                                | 9833417                                                                                 | 9831601                                                                                 | 9833247  |
| 160 PSI        | 9833565                                                                               | 9833069                                                                                | 9833425                                                                                 | 9831619                                                                                 | 9833239  |
| 200 PSI        | 9833557                                                                               | 9833077                                                                                | 9833434                                                                                 | 9831627                                                                                 | 9833221  |
| 300 PSI        | 9833549                                                                               | 9833085                                                                                | 9833442                                                                                 | 9831635                                                                                 | 9833213  |
| 400 PSI        | 9833531                                                                               | 9833094                                                                                | 9833450                                                                                 | 9831644                                                                                 | 9833205  |
| 600 PSI        | 9833523                                                                               | 9833107                                                                                | 9833727                                                                                 | 9831652                                                                                 | 9833191  |
| 800 PSI        |                                                                                       |                                                                                        |                                                                                         |                                                                                         |          |
| 1,000 PSI      | 9833515                                                                               | 9833115                                                                                | 9833697                                                                                 | 9831678                                                                                 | 9833183  |
| 1,500 PSI      | 9833506                                                                               |                                                                                        | 9833701                                                                                 | 9831686                                                                                 | 9833175  |
| 2,000 PSI      | 9833493                                                                               |                                                                                        | 9833655                                                                                 | 9831695                                                                                 | 9833166  |
| 3,000 PSI      | 9833485                                                                               |                                                                                        | 9833719                                                                                 | 9831708                                                                                 | 9833158  |
| 5,000 PSI      | 9833476                                                                               |                                                                                        | 9833663                                                                                 | 9831716                                                                                 | 9833140  |
| 10,000 PSI     | 9833468                                                                               |                                                                                        | 9833671                                                                                 | 9831725                                                                                 | 9833132  |
| 15,000 PSI     |                                                                                       |                                                                                        | 9833689                                                                                 | 9831733                                                                                 |          |

| Type                  | 232.53- Stock Gauges with Ammonia Scales                                               |         |
|-----------------------|----------------------------------------------------------------------------------------|---------|
| Size                  | 2 1/2"                                                                                 | 4"      |
| Connection            | LM  |         |
| Conn. Size            | 1/4" NPT                                                                               |         |
| 30"-0-150 PSI / 84°F  | 9797144                                                                                | 9797127 |
| 30"-0-300 PSI / 126°F | 9797152                                                                                | 9797135 |



**G 57**

WIKA  
4272016  
0-10,000 PSI/BAR PRESSURE GAUGE

ANGI PART NUMBER 741-07289

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# Industrial Gauges

## Type 23X.53



Type 232.53 - Dry case  
Type 233.53 - Liquid filled case

- Stainless Steel Case & Crimp Ring
- Welded Case-to-Socket Connection
- Field Liquid-Fillable

The rugged construction of WIKAI Type 23X.53 stainless steel gauges provides resistance to the most corrosive media and environments. These gauges feature 316 stainless steel wetted parts and a 304 stainless steel case and crimped ring, and can be liquid-filled in the field.

### Standard Features

- Nominal Case Size: 2" (53 mm) **2½"** (68 mm), 4" (100 mm)
- Case Material: 304 stainless steel
- Wetted Parts: 316 SS
- Window Type & Material: 2½" Polycarbonate; 4" Acrylic
- Removable Window: No
- Dial Material: White aluminum
- Bezel Ring Type & Material: Crimp on SS polished
- Liquid Fillable Gauge: Yes
- Case-to-Socket O-ring Material: Welded
- "Other" Gaskets/O-ring Types & Materials:  
Window gasket, BUNA-N
- Pointer Material/Type: Black aluminum
- Adjustable Pointer: No
- Accuracy:  $\pm 1.5\%$  of span (2" & 2½");  
(4")  $\pm 1.0\%$  of span-ASME B40.100 Grade 1A
- Connection locations: LM (Lower Mount),  
CBM (Center Back Mount)  
& LBM (Lower Back Mount) (4" only)
- Media Operating Temperature: 212°F
- Ambient Operating Temperature: -40°F to 140°F dry;  
-4°F to 140°F glycerine case fill; -40°F to 140°F silicone  
case fill

### Available Options:

- "Dampened Movement" Option: Yes,  
(N/A on 2½" CBM or 2" LM/CBM) & LBM
- U-Clamp Bracket: Yes (CBM only)
- Front Flange: Yes (CBM & LBM only)
- Rear Flange: Yes (LM, CBM & LBM)
- Restrictor: Yes
- Safety Glass Window: No
- Instrument Glass Window (flat glass): No
- Drag Pointer (maximum reading indicator): Yes
- Cleaned for Use in Oxygen Service: Yes
- Panel Mount Kit: Yes (see front flange or u-clamp option)
- Magnetic or Inductive Contact Switches: No
- Receiver Gauge Scales: Yes
- Special Connection: Limited to wrench flat area

|                             |                                                                                      |                                                                                         |         |         |                        |
|-----------------------------|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|---------|---------|------------------------|
| Type                        | 232.53                                                                               |                                                                                         |         |         |                        |
| Connection                  | LM  | CBM  |         |         |                        |
| Conn. Size                  | 1/4" NPT                                                                             |                                                                                         |         |         |                        |
| Size                        | 2 1/2"                                                                               |                                                                                         |         |         |                        |
| Pressure Scale <sup>1</sup> | PSI                                                                                  | PSI                                                                                     | PSI/BAR | PSI/KPA | PSI/KG/CM <sup>2</sup> |
| 30" Hg                      | 9768777                                                                              | 9768394                                                                                 |         |         |                        |
| 30"-0-15 PSI                |                                                                                      |                                                                                         |         |         |                        |
| 30"-0-30 PSI                | 9768769                                                                              | 9768386                                                                                 |         |         |                        |
| 30"-0-60 PSI                | 9768750                                                                              | 9768378                                                                                 |         |         |                        |
| 30"-0-100 PSI               |                                                                                      |                                                                                         |         |         |                        |
| 30"-0-160 PSI               | 9768742                                                                              | 9768360                                                                                 |         |         |                        |
| 30"-0-200 PSI               |                                                                                      |                                                                                         |         |         |                        |
| 15 PSI                      | 9768734                                                                              | 9768351                                                                                 |         |         |                        |
| 30 PSI                      | 9768726                                                                              | 9768343                                                                                 |         |         |                        |
| 60 PSI                      | 9768718                                                                              | 9768335                                                                                 | 8992848 | 8993089 | 8992962                |
| 100 PSI                     | 9768700                                                                              | 9768327                                                                                 | 8992856 | 8993097 | 8992970                |
| 160 PSI                     | 9768696                                                                              | 9768319                                                                                 | 8992865 | 8993101 | 8992988                |
| 200 PSI                     | 9768688                                                                              | 9768300                                                                                 | 8992873 | 8993119 | 8992996                |
| 300 PSI                     | 9768670                                                                              | 9768297                                                                                 | 8992881 | 8993127 | 8993004                |
| 400 PSI                     | 9768661                                                                              | 9768289                                                                                 |         |         |                        |
| 600 PSI                     | 9768653                                                                              | 9768270                                                                                 | 9779685 | 9779693 |                        |
| 800 PSI                     |                                                                                      |                                                                                         |         |         |                        |
| 1,000 PSI                   | 9768645                                                                              | 9768262                                                                                 | 8992899 | 8993135 | 8993012                |
| 1,500 PSI                   | 9768637                                                                              | 9768254                                                                                 | 8992903 | 8993144 | 8993020                |
| 2,000 PSI                   | 9768629                                                                              | 9768246                                                                                 | 8992911 | 8993152 | 8993038                |
| 3,000 PSI                   | 9768610                                                                              | 9768238                                                                                 | 8992929 | 8993160 | 8993046                |
| 5,000 PSI                   | 9768602                                                                              | 9768220                                                                                 | 8992937 | 8993178 | 8993055                |
| 6,000 PSI                   |                                                                                      | 8993208                                                                                 | 8992945 | 8993186 | 8993063                |
| 10,000 PSI                  | 9768599                                                                              | 9768211                                                                                 | 8992954 | 8993195 | 8993071                |
| 15,000 PSI                  |                                                                                      | 9779715                                                                                 | 9776715 |         | 9779731                |

<sup>1</sup>PSI/BAR<sup>2</sup> denotes dual scale; PSI outside in black, BAR inside in red; <sup>2</sup>PSI/KPA<sup>2</sup> denotes dual scale; PSI outside in black, KPA inside in red; <sup>3</sup>PSI/KG/CM<sup>2</sup> denotes dual scale; PSI outside in black, KG/CM<sup>2</sup> inside in red. Note: Vacuum scale: 30" Hg outside in black; 760 mm Hg inside in red. <sup>2</sup>

Note: For options not shown - consult your WIKAI Distributor or the Factory.

### Data sheet: 23X.53

For liquid filled gauges, add "-B29" to part numbers above for 2½" size or "-B34" for 4" size.

Items shown with part numbers indicate readily available standard WIKAI products. Items shown without part numbers are available on special order.

| Type           | 232.53- liquid fillable                                                              |                                                                                      |                                                                                       |
|----------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Connection     | LM  | LM  | LBM  |
| Conn. Size     | 1/4" NPT                                                                             |                                                                                      | 1/2" NPT                                                                              |
| Size           | 4"                                                                                   |                                                                                      |                                                                                       |
| Pressure Scale | PSI                                                                                  | PSI                                                                                  | PSI                                                                                   |
| 30" Hg         | 9767576                                                                              | 9768459                                                                              | 9737057                                                                               |
| 30"-0-15 PSI   | 9737910                                                                              | 9768467                                                                              | 9737065                                                                               |
| 30"-0-30 PSI   | 9767398                                                                              | 9768475                                                                              | 9737073                                                                               |
| 30"-0-60 PSI   | 9767401                                                                              | 9768483                                                                              | 9737081                                                                               |
| 30"-0-100 PSI  | 9737898                                                                              | 9737880                                                                              | 9737090                                                                               |
| 30"-0-160 PSI  | 9767410                                                                              | 9768491                                                                              | 9737103                                                                               |
| 30"-0-200 PSI  | 9737901                                                                              | 9768505                                                                              | 9737111                                                                               |
| 30"-0-300 PSI  | 4260147                                                                              |                                                                                      |                                                                                       |
| 30"-0-400 PSI  | 4260155                                                                              |                                                                                      |                                                                                       |
| 15 PSI         | 9767428                                                                              | 9768513                                                                              | 9737120                                                                               |
| 30 PSI         | 9767436                                                                              | 9768521                                                                              | 9737138                                                                               |
| 60 PSI         | 9767444                                                                              | 9768530                                                                              | 9737146                                                                               |
| 100 PSI        | 9767452                                                                              | 9768548                                                                              | 9737154                                                                               |
| 160 PSI        | 9767460                                                                              | 9768556                                                                              | 9737162                                                                               |
| 200 PSI        | 9767479                                                                              | 9768564                                                                              | 9737170                                                                               |
| 300 PSI        | 9767487                                                                              | 9768572                                                                              | 9737189                                                                               |
| 400 PSI        | 9767495                                                                              | 9768580                                                                              | 9737197                                                                               |
| 600 PSI        | 9767509                                                                              | 9768963                                                                              | 9737200                                                                               |
| 800 PSI        |                                                                                      |                                                                                      | 9737219                                                                               |
| 1,000 PSI      | 9767517                                                                              | 9768858                                                                              | 9737227                                                                               |
| 1,500 PSI      |                                                                                      | 9768866                                                                              | 9737235                                                                               |
| 2,000 PSI      |                                                                                      | 9768807                                                                              | 9737243                                                                               |
| 3,000 PSI      |                                                                                      | 9768874                                                                              | 9737251                                                                               |
| 5,000 PSI      |                                                                                      | 9768823                                                                              | 9737260                                                                               |
| 10,000 PSI     |                                                                                      | 9768831                                                                              | 9737278                                                                               |
| 15,000 PSI     |                                                                                      | 9768840                                                                              | 9737286                                                                               |

| Type           | 233.53- glycerine filled                                                              |                                                                                        |                                                                                         |                                                                                         |          |
|----------------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|----------|
| Connection     | LM  | LM  | LBM  | CBM  |          |
| Conn. Size     | 1/4" NPT                                                                              |                                                                                        | 1/2" NPT                                                                                |                                                                                         | 1/4" NPT |
| Size           | 2 1/2"                                                                                | 4"                                                                                     | 4"                                                                                      |                                                                                         | 2 1/2"   |
| Pressure Scale | PSI                                                                                   | PSI                                                                                    | PSI                                                                                     | PSI                                                                                     | PSI      |
| 30" Hg         | 9833646                                                                               | 9833124                                                                                | 9833328                                                                                 | 9831504                                                                                 | 9833310  |
| 30"-0-15 PSI   |                                                                                       | 9831775                                                                                | 9833336                                                                                 | 9831512                                                                                 |          |
| 30"-0-30 PSI   | 9833638                                                                               | 9832993                                                                                | 9833345                                                                                 | 9831520                                                                                 | 9833302  |
| 30"-0-60 PSI   | 9833620                                                                               | 9833000                                                                                | 9833353                                                                                 | 9831538                                                                                 | 9833298  |
| 30"-0-100 PSI  |                                                                                       | 9831759                                                                                | 9831741                                                                                 | 9831546                                                                                 |          |
| 30"-0-160 PSI  | 9833612                                                                               | 9833018                                                                                | 9833361                                                                                 | 9831555                                                                                 | 9833280  |
| 30"-0-200 PSI  |                                                                                       | 9831767                                                                                | 9833379                                                                                 | 9831563                                                                                 |          |
| 30"-0-300 PSI  |                                                                                       |                                                                                        |                                                                                         |                                                                                         |          |
| 30"-0-400 PSI  |                                                                                       |                                                                                        |                                                                                         |                                                                                         |          |
| 15 PSI         | 9833604                                                                               | 9833026                                                                                | 9833387                                                                                 | 9831571                                                                                 | 9833272  |
| 30 PSI         | 9833590                                                                               | 9833035                                                                                | 9833395                                                                                 | 9831589                                                                                 | 9833264  |
| 60 PSI         | 9833582                                                                               | 9833043                                                                                | 9833409                                                                                 | 9831597                                                                                 | 9833255  |
| 100 PSI        | 9833574                                                                               | 9833051                                                                                | 9833417                                                                                 | 9831601                                                                                 | 9833247  |
| 160 PSI        | 9833565                                                                               | 9833069                                                                                | 9833425                                                                                 | 9831619                                                                                 | 9833239  |
| 200 PSI        | 9833557                                                                               | 9833077                                                                                | 9833434                                                                                 | 9831627                                                                                 | 9833221  |
| 300 PSI        | 9833549                                                                               | 9833085                                                                                | 9833442                                                                                 | 9831635                                                                                 | 9833213  |
| 400 PSI        | 9833531                                                                               | 9833094                                                                                | 9833450                                                                                 | 9831644                                                                                 | 9833205  |
| 600 PSI        | 9833523                                                                               | 9833107                                                                                | 9833727                                                                                 | 9831652                                                                                 | 9833191  |
| 800 PSI        |                                                                                       |                                                                                        |                                                                                         |                                                                                         |          |
| 1,000 PSI      | 9833515                                                                               | 9833115                                                                                | 9833697                                                                                 | 9831678                                                                                 | 9833183  |
| 1,500 PSI      | 9833506                                                                               |                                                                                        | 9833701                                                                                 | 9831686                                                                                 | 9833175  |
| 2,000 PSI      | 9833493                                                                               |                                                                                        | 9833655                                                                                 | 9831695                                                                                 | 9833166  |
| 3,000 PSI      | 9833485                                                                               |                                                                                        | 9833719                                                                                 | 9831708                                                                                 | 9833158  |
| 5,000 PSI      | 9833476                                                                               |                                                                                        | 9833663                                                                                 | 9831716                                                                                 | 9833140  |
| 10,000 PSI     | 9833468                                                                               |                                                                                        | 9833671                                                                                 | 9831725                                                                                 | 9833132  |
| 15,000 PSI     |                                                                                       |                                                                                        | 9833689                                                                                 | 9831733                                                                                 |          |

| Type                  | 232.53- Stock Gauges with Ammonia Scales                                               |         |
|-----------------------|----------------------------------------------------------------------------------------|---------|
| Size                  | 2 1/2"                                                                                 | 4"      |
| Connection            | LM  |         |
| Conn. Size            | 1/4" NPT                                                                               |         |
| 30"-0-150 PSI / 84°F  | 9797144                                                                                | 9797127 |
| 30"-0-300 PSI / 126°F | 9797152                                                                                | 9797135 |



**MLV 4**

HOKE  
I711F4Y

1/2" FNPT MANUAL LINE VALVE 6000 PSI SS

ANGI PART NUMBER 338-07125

REBUILD KIT-HOKE NEEDLE VALVE SEAT & PKG – 761-07286

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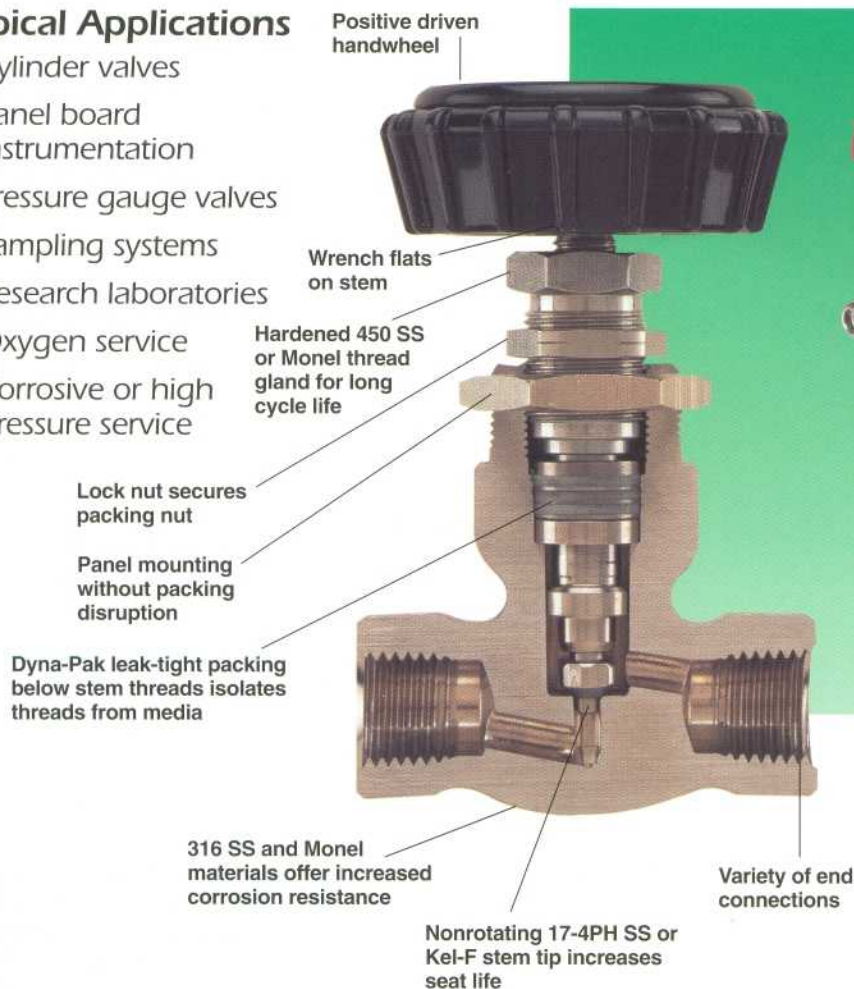


## 1700 Series

### Forged Body, Integral Bonnet Needle Valves

#### Typical Applications

- Cylinder valves
- Panel board instrumentation
- Pressure gauge valves
- Sampling systems
- Research laboratories
- Oxygen service
- Corrosive or high pressure service



With nonrotating stem tips and isolated stem threads for severe service and Dyna-Pak packing to help prevent fugitive emissions, these affordable valves are suited for a variety of applications.



#### Technical Data

**Maximum Operating Pressure:**  
6000 PSIG @ 70°F (41.4 MPa @ 21°C)

**Operating Temperature Range:**

Metal Stem Tip  
-65° to 450°F (-54° to 232°C)

Kel-F Stem Tip  
-20° to 250°F (-29° to 121°C)

**Orifice:**  
.187 in. (4.8mm)

**Cv Factor:**  
.31

**End Connections:**  
1/8 to 3/8 in. Gyrolok®  
1/4 to 3/8 NPT  
6 to 8mm Gyrolok

#### Benefits

**Safety**

Lock nut secures packing nut against accidental removal.

**Long cycle life**

Packing below stem threads prevents fluid from contacting the stem threads. Nonrotating hardened 17-4PH stainless steel or replaceable Kel-F stem tips combine with a hardened 450 stainless steel or Monel thread gland to reduce galling.

**Helps eliminate fugitive emissions**

Dyna-Pak® packing provides a leak-tight seal with low operating torque.



**Reliability**

All valves are tested for bubble-tight leakage at both seat and packing.

**Installation variety**

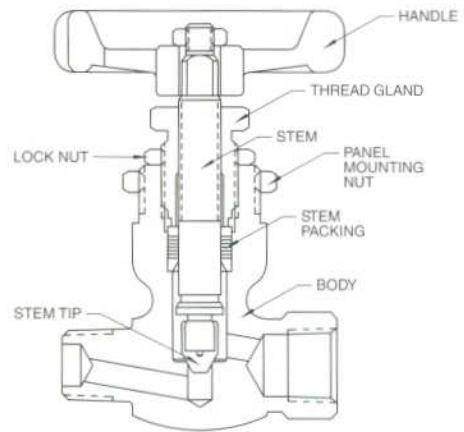
Broad selection of male NPT, female NPT, and Hoke Gyrolok fractional or metric tube fitting connections.

**Panel mounting**

Panel mounting is standard on all models.

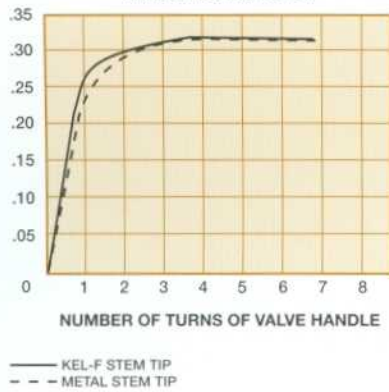
## Materials of Construction

| Description        | 316 SS Valves       | Monel® Valves       |
|--------------------|---------------------|---------------------|
| Body               | 316 SS              | Monel               |
| Stem               | 316 SS              | Monel               |
| Stem Tip           |                     |                     |
| Soft               | Kel-F®              | Kel-F               |
| Hard               | 17-4PH SS           | Monel               |
| Stem Packing       | TFE/316 SS Wafers   | TFE/Monel Wafers    |
| Thread Gland       | 450 SS              | Monel               |
| Lock Nut           | 316 SS              | 316 SS              |
| Handle             |                     |                     |
| 1711 Series        | Aluminum            | Aluminum            |
| 1751 Series        | ABS                 | ABS                 |
| Panel Mounting Nut | Nickel Plated Brass | Nickel Plated Brass |

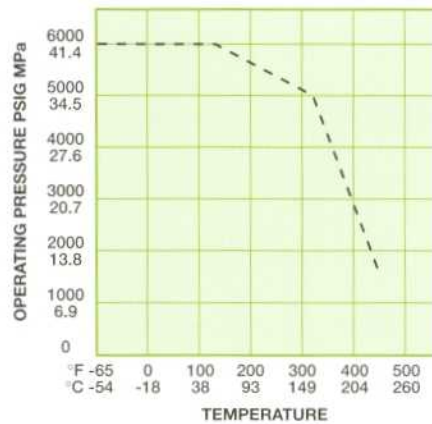


## Flow Curve

HANDLE TURNS VS. Cv



## Pressure vs. Temperature Curve



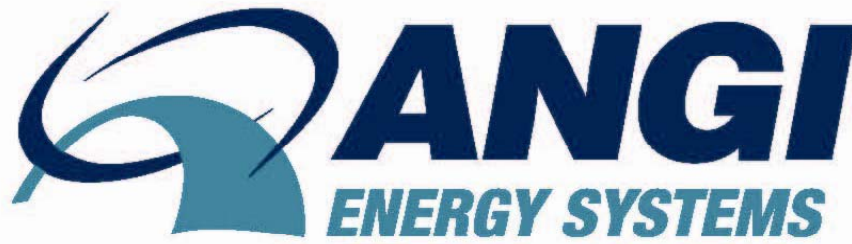
## Valve Ordering Charts



1711L4Y

### 1700 Series Globe Pattern Metal Stem Tip for Service to 450°F .187 Orifice/.31 Cv

| End Connections |                | Order by Part Number |         |
|-----------------|----------------|----------------------|---------|
| Inlet           | Outlet         | 316 SS               | Monel   |
| 1/8 Gyrolok     | 1/8 Gyrolok    | 1711G2Y              | —       |
| 1/4 Gyrolok     | 1/4 Gyrolok    | 1711G4Y              | —       |
| 1/4 Male NPT    | 1/4 Male NPT   | 1711M4Y              | 1711M4M |
| 1/4 Male NPT    | 1/4 Female NPT | 1711L4Y              | —       |
| 1/4 Female NPT  | 1/4 Female NPT | 1711F4Y              | 1711F4M |
| 3/8 Gyrolok     | 3/8 Gyrolok    | 1711G6Y              | —       |
| 3/8 Male NPT    | 3/8 Male NPT   | 1711M6Y              | —       |
| 6mm Gyrolok     | 6mm Gyrolok    | 1711G6Y/MM           | —       |
| 8mm Gyrolok     | 8mm Gyrolok    | 1711G8Y/MM           | —       |



**MV 269**

SVF  
HBEV766DTSE10  
1" FNPT BALL VALVE, SS, FULL PORT  
6000 PSI

ANGI PART NUMBER 334-07476

NO VALVE REBUILD KIT AVAILABLE

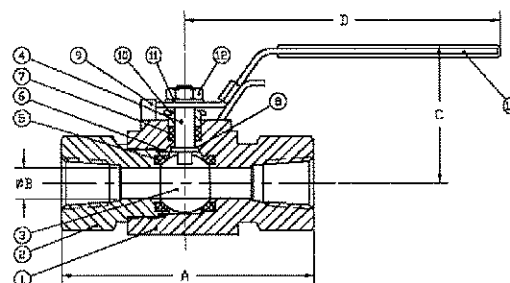
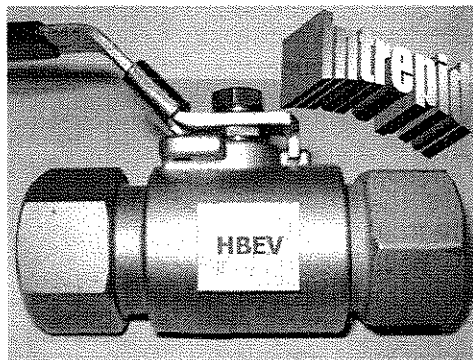
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**Series "HBEV" High Pressure Ball Valve**

**Certified to API-607-05 Fire Safe**

SVF Series HBEV ball valves are designed for extreme pressures in a wide range of industries and applications.

- SEAL WELDED CONSTRUCTION
- Full port design
- Stainless steel construction
- 6000 WOG Rating
- Fully Compliant with ASME B16.34 Class 2500
- Delrin Seats: Standard with threaded end valves
- PEEK Seats: Standard with Socket Weld valves
- NACE MR-01-75 Compliant
- Standard ISO-5211 mounting pad on all sizes
- Fire Safe design to API-607-05
- Standard locking handle on all sizes
- Size Range: 1/4" to 2" Full Port



**MATERIALS OF CONSTRUCTION**

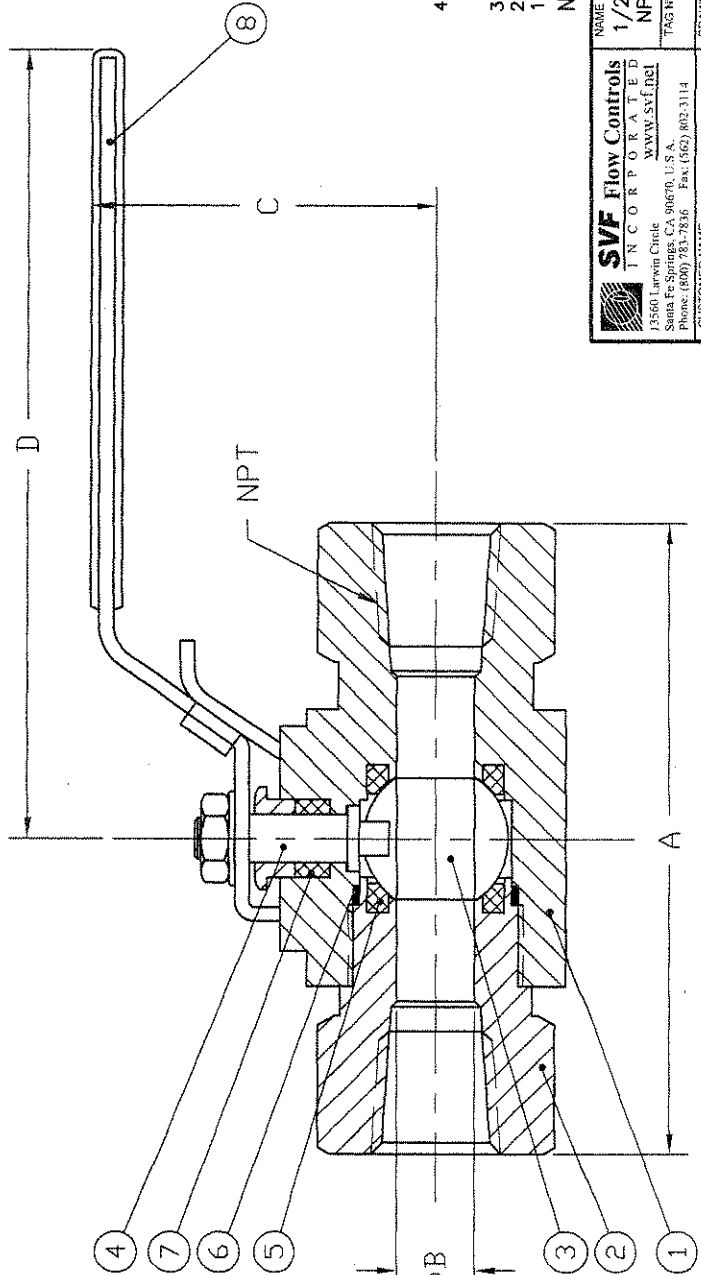
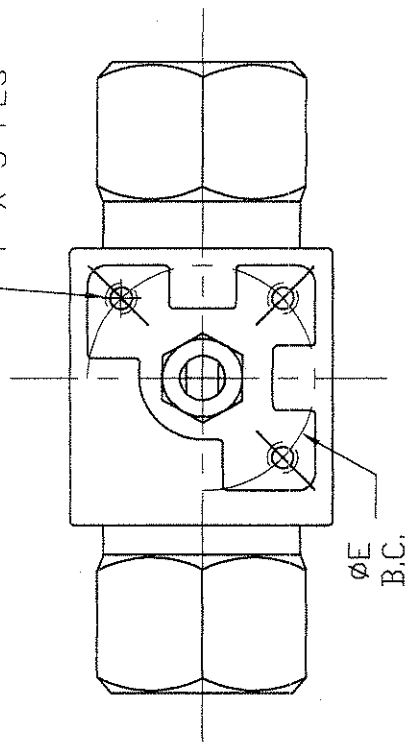
| ITEM | COMPONENTS    | MATERIAL        | STANDARD       |
|------|---------------|-----------------|----------------|
| 1    | BODY          | STAINLESS STEEL | ASTM-A351-CF8M |
| 2    | END CONNECTOR | STAINLESS STEEL | ASTM-A351-CF8M |
| 3    | BALL          | STAINLESS STEEL | ASTM-A351-CF8M |
| 4    | STEM          | STAINLESS STEEL | 17-4 PH        |
| 5    | SEAT          | DELIN/PEEK      |                |
| 6    | SEAL          | PTFE            |                |
| 7    | STEM PACKING  | GRAPHITE        |                |
| 8    | THRUST WASHER | PEEK            |                |
| 9    | STOP PIN      | STAINLESS STEEL |                |
| 10   | GLAND NUT     | STAINLESS STEEL |                |
| 11   | STEM WASHER   | STAINLESS STEEL |                |
| 12   | STEM NUT      | STAINLESS STEEL |                |
| 13   | HANDLE        | STAINLESS STEEL |                |



Series "HBEV" High Pressure Valve

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F X 3 PLS



# MATERIALS OF CONSTRUCTION

| ITEM | NAME           | MATERIAL        | STANDARD       |
|------|----------------|-----------------|----------------|
| 1    | BODY           | STAINLESS STEEL | ASTM A351-CF8M |
| 2    | END CONNECTORS | STAINLESS STEEL | ASTM A351-CF8M |
| 3    | BALL           | STAINLESS STEEL | ASTM A351-CF8M |
| 4    | STEM           | STAINLESS STEEL | ASTM A276-316  |
| 5    | SEAT           | PEEK            |                |
| 6    | SEAL           | PTFE            |                |
| 7    | STEM PACKING   | GRAPHITE        |                |
| 8    | HANDLE         | STAINLESS STEEL |                |

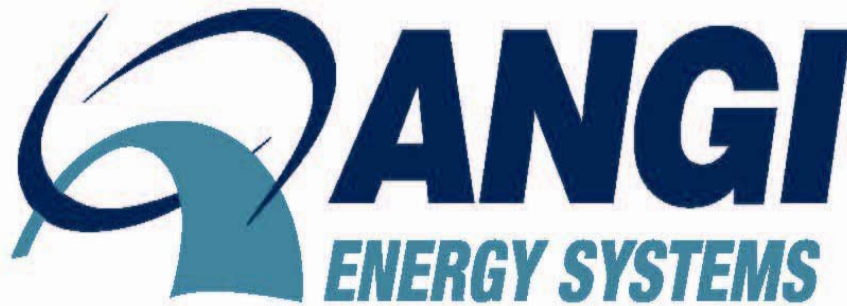
| SIZE   | A    | ØB   | C    | D     | ØE    | F          |
|--------|------|------|------|-------|-------|------------|
| 1/4"   | 3.00 | 0.25 | 2.20 | 5.00  | 1.417 | M5 X 0.8P  |
| 3/8"   | 3.00 | 0.38 | 2.20 | 5.00  | 1.417 | M5 X 0.8P  |
| 1/2"   | 3.99 | 0.50 | 2.20 | 5.00  | 1.417 | M5 X 0.8P  |
| 3/4"   | 4.25 | 0.75 | 2.70 | 6.30  | 1.654 | M5 X 0.8P  |
| 1"     | 4.50 | 1.00 | 3.50 | 8.25  | 1.969 | M6 X 1.0P  |
| 1-1/2" | 5.25 | 1.50 | 4.45 | 10.20 | 2.756 | M8 X 1.25P |

4. MOUNTING HARDWARES, HANDLE, GEAR OPERATOR, HANDWHEEL, ACTUATOR AND ACCESSORIES ARE MANUFACTURER'S STANDARDS WHERE APPLICABLE.
3. PRESSURE RATING CLASS 6000PSI CWP.
2. VALVES CONFORM TO N/A
1. ALL DIMENSIONS ARE MAXIMUM, EXCEPT FACE TO FACE.

NOTE:

|                                                                                                                             |                                  |                                          |                  |
|-----------------------------------------------------------------------------------------------------------------------------|----------------------------------|------------------------------------------|------------------|
| <b>SVF Flow Controls</b><br>INCORPORATED<br>Santa Fe Springs, CA 90670, U.S.A.<br>Phone: (800) 781-7836 Fax: (562) 892-3114 |                                  | VALVE MODEL NUMBER<br><b>HBEV766DTSE</b> |                  |
| NAME<br><b>1/2" TO 1-1/2" SERIES HBEV BALL VALVES</b>                                                                       |                                  | REMARK                                   |                  |
| TAG NUMBER<br><b>N/A</b>                                                                                                    | SALES ORDER NUMBER<br><b>N/A</b> | CERTIFIED BY                             | DATE             |
| DRAWN BY<br><b>Charles Chen</b>                                                                                             | DATE<br><b>06/08/04</b>          | SCALE<br><b>N.T.S.</b>                   | SHEET 1 OF 1     |
| CUSTOMER NAME<br><b>N/A</b>                                                                                                 | P.O. NUMBER<br><b>N/A</b>        | DRAWING NUMBER<br><b>HBEV766DTSE0515</b> | REV.<br><b>A</b> |

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**MV 303**

**SVF/SVF**

**H7666MDBSE05**

**1/2" VALVE ACTUATOR ASSY SAE 8 6000# 3-PIECE, 6-BOLT,  
W/A2S-50-12-V-NC ACT NORMALLY CLOSED**

**ANGI PART NUMBER- 334-07513  
ACTUATOR REBUILD KIT- 761-07465  
VALVE REBUILD KIT- 761-07370**





# Series H7 Ball Valve

## Three-Piece High Pressure Ball Valve

Sizes 1/2" ~ 2"

**H7**

The SVF Series H7 Standard Port high pressure ball valve is designed to meet applications up to 6000 psi. This engineered valve features a Carbon or Stainless Steel Body and is available in a variety of alloy materials. The H7 adds safety and reliability to high pressure systems and applications in Offshore, Oil & Gas, Petrochemical, Power and Refining.

### SERIES H7 DESIGN FEATURES

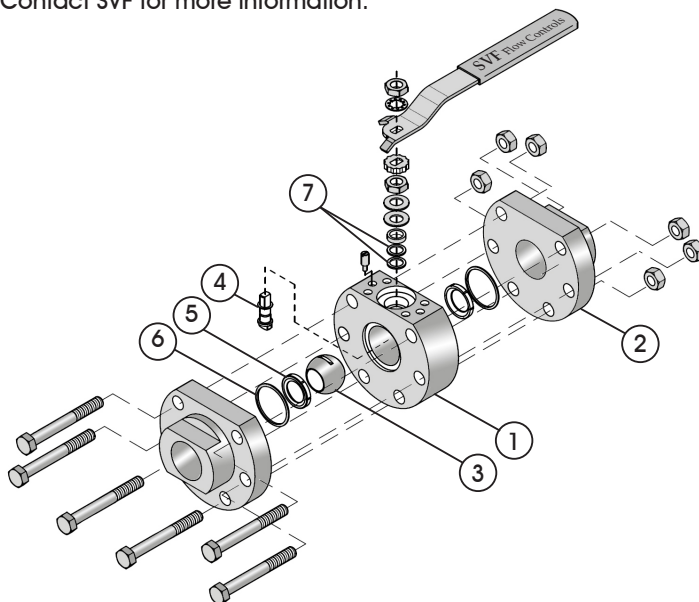
- ✓ High pressure to 6000 psi
- ✓ Live-loaded stem packing ensures seal-tight pressure containment even under thermal cycling
- ✓ Three-piece "swing out" design offers easy access for in-line maintenance
- ✓ Standard seat material is Delrin®
- ✓ Blowout proof stem adds safety & reliability
- ✓ Stainless Steel fasteners and handle



The Series H7 Ball Valve is available with additional options. Contact SVF for more information.

### MATERIALS OF CONSTRUCTION

| ITEM # | DESCRIPTION   | MATERIALS SPECIFICATIONS<br>(Additional options available)             |
|--------|---------------|------------------------------------------------------------------------|
| 1      | Body          | Carbon Steel (ASTM A216 WCB),<br>316 Stainless Steel (ASTM A351 CF8M)  |
| 2      | End Connector | Carbon Steel (ASTM A216 WCB),<br>316L Stainless Steel (ASTM A351 CF3M) |
| 3      | Ball          | 316 Stainless Steel (ASTM A351 CF8M)                                   |
| 4      | Stem          | Stainless Steel 17-4 ph (ASTM A564 630)                                |
| 5      | Seat          | Delrin®, PEEK                                                          |
| 6      | Body Seal     | Buna "N", Viton®, EPDM                                                 |
| 7      | Stem Seal     | SupraLon™                                                              |



### SPECIFICATION STANDARDS OF COMPLIANCE

SVF Series H7 Ball Valves are available in designs that meet the following Industry Standards:

- ANSI
- ASME
- API
- DIN
- ISO
- MSS
- BPE
- NACE
- ASTM

Contact SVF for specific applications

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Specifications subject to change. Please visit [www.SVF.net](http://www.SVF.net) for the latest updates on this Data Sheet. All Data Sheets posted on our website supersede all prior publications • [Document SVF\_H7\_Data\_Sheet • Series H7 Data Sheet - 01/24/2012]

[www.SVF.net](http://www.SVF.net)

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# Series H7 Ball Valve

## Three-Piece High Pressure Ball Valve

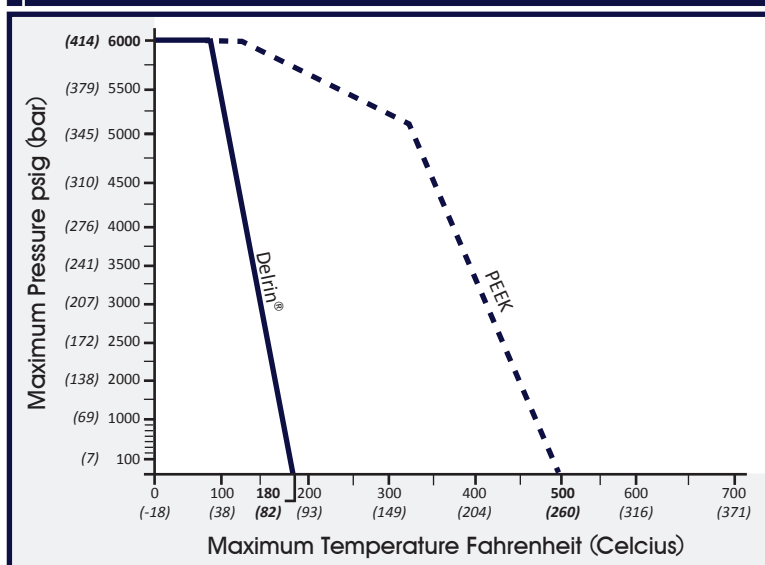
Sizes 1/2" ~ 2"

**H7**

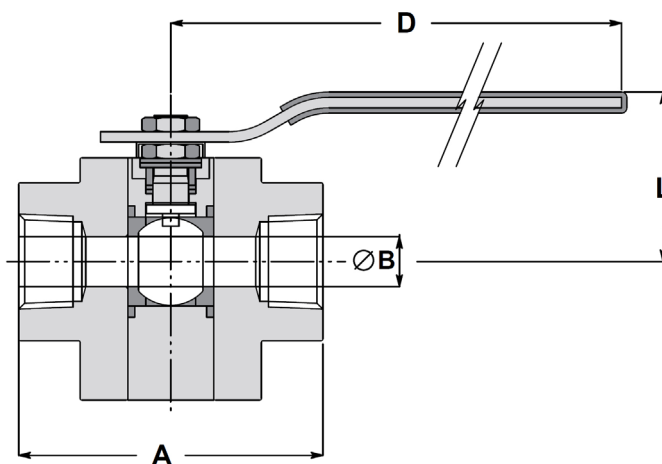
### DIMENSIONS, WEIGHT, CV, TORQUE

| Size   | A    |     | B    |    | D   |     | L   |    | Weight |      | Cv  | Torque* |     |
|--------|------|-----|------|----|-----|-----|-----|----|--------|------|-----|---------|-----|
|        | in.  | mm  | in.  | mm | in. | mm  | in. | mm | lbs    | kg   |     | in-lbf  | Nm  |
| 1/2"   | 2.78 | 71  | 0.44 | 11 | 5   | 127 | 1.8 | 46 | 3.5    | 1.6  | 8   | 60      | 7   |
| 3/4"   | 3.48 | 88  | 0.56 | 14 | 5   | 127 | 1.9 | 48 | 5.3    | 2.4  | 12  | 200     | 23  |
| 1"     | 3.69 | 94  | 0.81 | 21 | 6   | 152 | 2.4 | 61 | 9.9    | 4.5  | 32  | 300     | 34  |
| 1-1/2" | 5.04 | 128 | 1.25 | 32 | 11  | 279 | 3.2 | 81 | 20.9   | 9.5  | 80  | 550     | 62  |
| 2"     | 6.14 | 156 | 1.50 | 38 | 11  | 279 | 3.3 | 84 | 28.9   | 13.1 | 104 | 1100    | 124 |

### H7 - PRESSURE/TEMPERATURE CHART

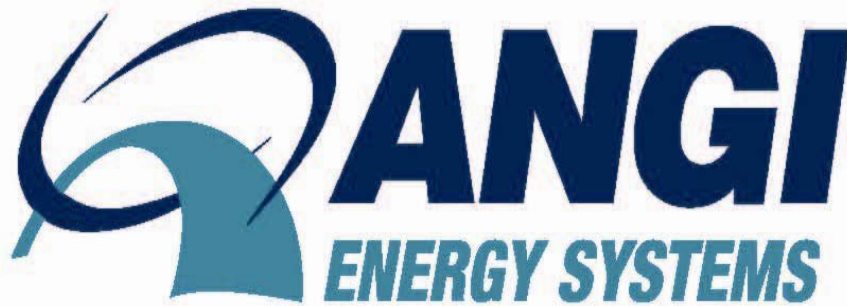


\* At full differential pressure for clean fluids with Delrin® Seats



### HOW TO ORDER SERIES H7 BALL VALVES

| SERIES                                                                                                                                                                                      | BODY & END MATERIAL                                                                                                                                                | BALL & STEM MATERIAL                                                                            | SEAT                                  | BODY SEAL                                                   | ENDS                                                                         | SIZE                                                                                           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|---------------------------------------|-------------------------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| H7 = Standard Port                                                                                                                                                                          | <b>44</b> = Carbon Steel<br>ASTM A216 WCB<br><br><b>66</b> = Body:<br>316 Stainless Steel<br>ASTM A351 CF8M<br><br>Ends:<br>316L Stainless Steel<br>ASTM A351 CF3M | <b>6M</b> = Ball:<br>316 Stainless Steel<br>ASTM A351 CF8M<br><br>Stem:<br>17-4ph ASTM A564 630 | <b>D</b> = Delrin®<br><b>K</b> = PEEK | <b>B</b> = Buna "N"<br><b>V</b> = Viton®<br><b>E</b> = EPDM | <b>SE</b> =<br>Screwed Ends<br>(FNPT)<br><br><b>SW</b> =<br>Socket Weld Ends | <b>05</b> = 1/2"<br><b>07</b> = 3/4"<br><b>10</b> = 1"<br><b>15</b> = 1-1/2"<br><b>20</b> = 2" |
| <b>Order Example: (H7666MDBSE05)</b>                                                                                                                                                        |                                                                                                                                                                    |                                                                                                 |                                       |                                                             |                                                                              |                                                                                                |
| <b>Example Description:</b><br>316 Stainless Steel Body, 316L Stainless Steel Ends, 316 Stainless Steel Ball, 17-4ph Stem, Delrin® Seat, Buna "N" Body Seal, Screwed Ends (FNPT), 1/2" Size |                                                                                                                                                                    |                                                                                                 |                                       |                                                             |                                                                              |                                                                                                |
| H7                                                                                                                                                                                          | 66                                                                                                                                                                 | 6M                                                                                              | D                                     | B                                                           | SE                                                                           | 05                                                                                             |



**MV 305**

**SVF/SVF  
H7666MDBSE10**

**1" VALVE ASSY SAE 16 S.P. 6000# 3-PIECE, 6-BOLT,  
W/A2S-110-10-V-NC ACT NORMALLY CLOSED**

**ANGI PART NUMBER- 334-07515  
ACTUATOR REBUILD KIT- 761-07461  
VALVE REBUILD KIT- 761-07287**





# Series H7 Ball Valve

## Three-Piece High Pressure Ball Valve

Sizes 1/2" ~ 2"

**H7**

The SVF Series H7 Standard Port high pressure ball valve is designed to meet applications up to 6000 psi. This engineered valve features a Carbon or Stainless Steel Body and is available in a variety of alloy materials. The H7 adds safety and reliability to high pressure systems and applications in Offshore, Oil & Gas, Petrochemical, Power and Refining.

### SERIES H7 DESIGN FEATURES

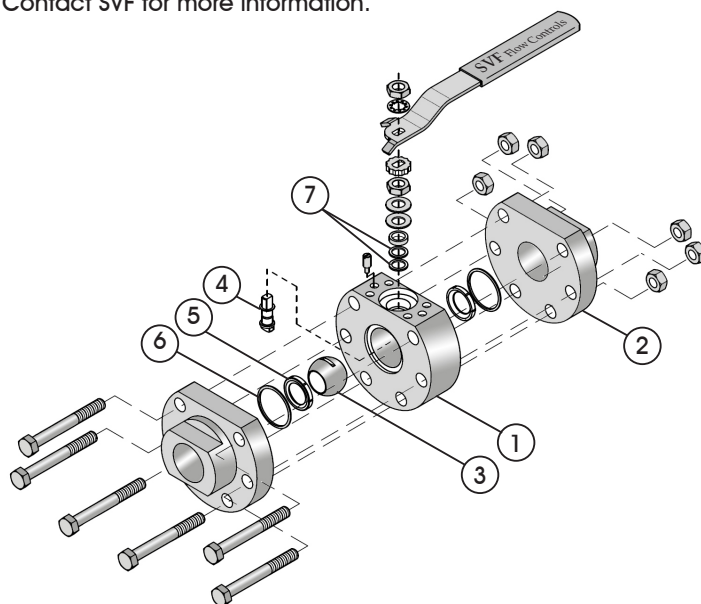
- ✓ High pressure to 6000 psi
- ✓ Live-loaded stem packing ensures seal-tight pressure containment even under thermal cycling
- ✓ Three-piece "swing out" design offers easy access for in-line maintenance
- ✓ Standard seat material is Delrin®
- ✓ Blowout proof stem adds safety & reliability
- ✓ Stainless Steel fasteners and handle



The Series H7 Ball Valve is available with additional options. Contact SVF for more information.

### MATERIALS OF CONSTRUCTION

| ITEM # | DESCRIPTION   | MATERIALS SPECIFICATIONS<br>(Additional options available)             |
|--------|---------------|------------------------------------------------------------------------|
| 1      | Body          | Carbon Steel (ASTM A216 WCB),<br>316 Stainless Steel (ASTM A351 CF8M)  |
| 2      | End Connector | Carbon Steel (ASTM A216 WCB),<br>316L Stainless Steel (ASTM A351 CF3M) |
| 3      | Ball          | 316 Stainless Steel (ASTM A351 CF8M)                                   |
| 4      | Stem          | Stainless Steel 17-4 ph (ASTM A564 630)                                |
| 5      | Seat          | Delrin®, PEEK                                                          |
| 6      | Body Seal     | Buna "N", Viton®, EPDM                                                 |
| 7      | Stem Seal     | SupraLon™                                                              |



### SPECIFICATION STANDARDS OF COMPLIANCE

SVF Series H7 Ball Valves are available in designs that meet the following Industry Standards:

- ANSI
- ASME
- API
- DIN
- ISO
- MSS
- BPE
- NACE
- ASTM

Contact SVF for specific applications

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# Series H7 Ball Valve

## Three-Piece High Pressure Ball Valve

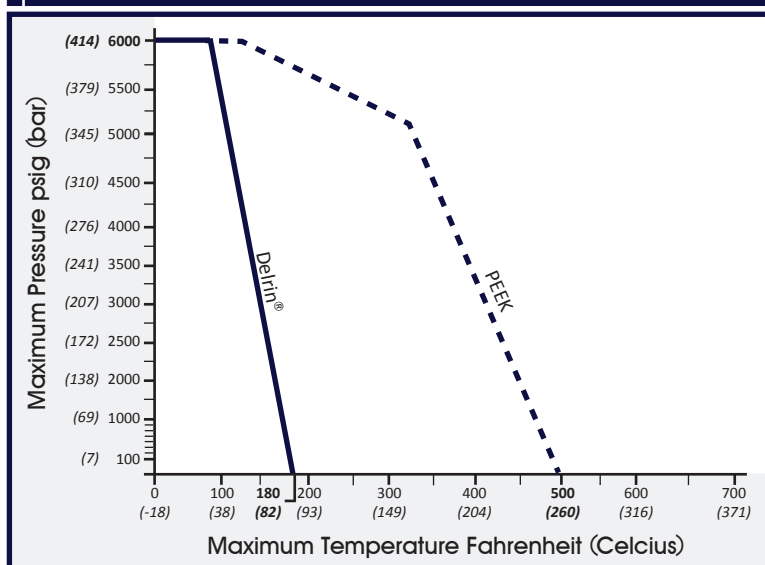
Sizes 1/2" ~ 2"

**H7**

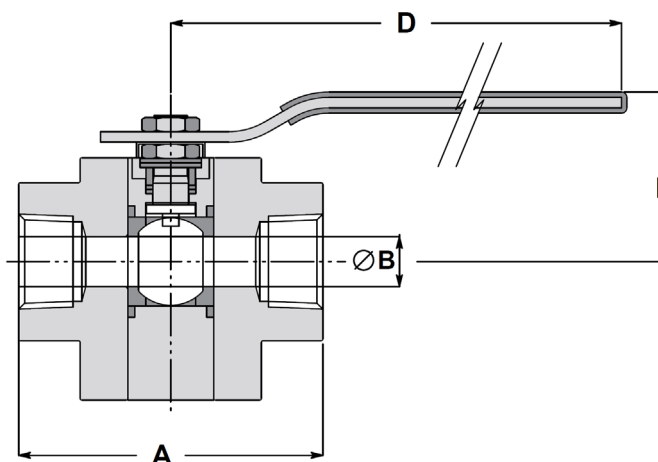
### DIMENSIONS, WEIGHT, CV, TORQUE

| Size   | A    |     | B    |    | D   |     | L   |    | Weight |      | Cv  | Torque* |     |
|--------|------|-----|------|----|-----|-----|-----|----|--------|------|-----|---------|-----|
|        | in.  | mm  | in.  | mm | in. | mm  | in. | mm | lbs    | kg   |     | in-lbf  | Nm  |
| 1/2"   | 2.78 | 71  | 0.44 | 11 | 5   | 127 | 1.8 | 46 | 3.5    | 1.6  | 8   | 60      | 7   |
| 3/4"   | 3.48 | 88  | 0.56 | 14 | 5   | 127 | 1.9 | 48 | 5.3    | 2.4  | 12  | 200     | 23  |
| 1"     | 3.69 | 94  | 0.81 | 21 | 6   | 152 | 2.4 | 61 | 9.9    | 4.5  | 32  | 300     | 34  |
| 1-1/2" | 5.04 | 128 | 1.25 | 32 | 11  | 279 | 3.2 | 81 | 20.9   | 9.5  | 80  | 550     | 62  |
| 2"     | 6.14 | 156 | 1.50 | 38 | 11  | 279 | 3.3 | 84 | 28.9   | 13.1 | 104 | 1100    | 124 |

### H7 - PRESSURE/TEMPERATURE CHART

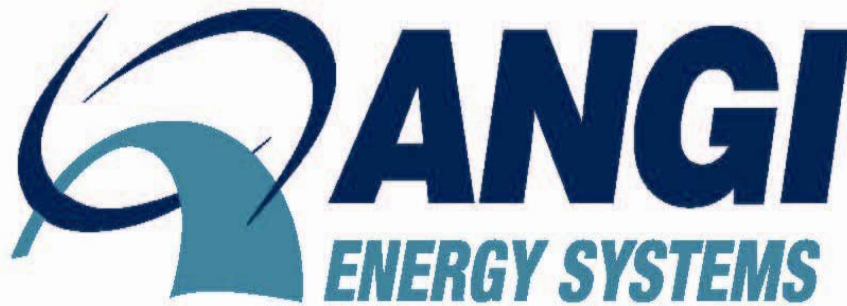


\* At full differential pressure for clean fluids with Delrin® Seats



### HOW TO ORDER SERIES H7 BALL VALVES

| SERIES                                                                                                                                                                                      | BODY & END MATERIAL                                                                                                                                                | BALL & STEM MATERIAL                                                                            | SEAT                                  | BODY SEAL                                                   | ENDS                                                                         | SIZE                                                                                           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|---------------------------------------|-------------------------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| H7 = Standard Port                                                                                                                                                                          | <b>44</b> = Carbon Steel<br>ASTM A216 WCB<br><br><b>66</b> = Body:<br>316 Stainless Steel<br>ASTM A351 CF8M<br><br>Ends:<br>316L Stainless Steel<br>ASTM A351 CF3M | <b>6M</b> = Ball:<br>316 Stainless Steel<br>ASTM A351 CF8M<br><br>Stem:<br>17-4ph ASTM A564 630 | <b>D</b> = Delrin®<br><b>K</b> = PEEK | <b>B</b> = Buna "N"<br><b>V</b> = Viton®<br><b>E</b> = EPDM | <b>SE</b> =<br>Screwed Ends<br>(FNPT)<br><br><b>SW</b> =<br>Socket Weld Ends | <b>05</b> = 1/2"<br><b>07</b> = 3/4"<br><b>10</b> = 1"<br><b>15</b> = 1-1/2"<br><b>20</b> = 2" |
| <b>Order Example: (H7666MDBSE05)</b>                                                                                                                                                        |                                                                                                                                                                    |                                                                                                 |                                       |                                                             |                                                                              |                                                                                                |
| <b>Example Description:</b><br>316 Stainless Steel Body, 316L Stainless Steel Ends, 316 Stainless Steel Ball, 17-4ph Stem, Delrin® Seat, Buna "N" Body Seal, Screwed Ends (FNPT), 1/2" Size |                                                                                                                                                                    |                                                                                                 |                                       |                                                             |                                                                              |                                                                                                |
| H7                                                                                                                                                                                          | 66                                                                                                                                                                 | 6M                                                                                              | D                                     | B                                                           | SE                                                                           | 05                                                                                             |



**MV 306**

**SVF/SVF**

**H7666MDBSE10**

**1" VALVE ASSY SAE 16 S.P. 6000# 3-PIECE, 6-BOLT,  
W/A2S-110-10-V-NO ACT NORMALLY OPEN**

**ANGI PART NUMBER- 334-07516  
ACTUATOR REBUILD KIT- 761-07461  
VALVE REBUILD KIT- 761-07287**





# Series H7 Ball Valve

## Three-Piece High Pressure Ball Valve

Sizes 1/2" ~ 2"

**H7**

The SVF Series H7 Standard Port high pressure ball valve is designed to meet applications up to 6000 psi. This engineered valve features a Carbon or Stainless Steel Body and is available in a variety of alloy materials. The H7 adds safety and reliability to high pressure systems and applications in Offshore, Oil & Gas, Petrochemical, Power and Refining.

### SERIES H7 DESIGN FEATURES

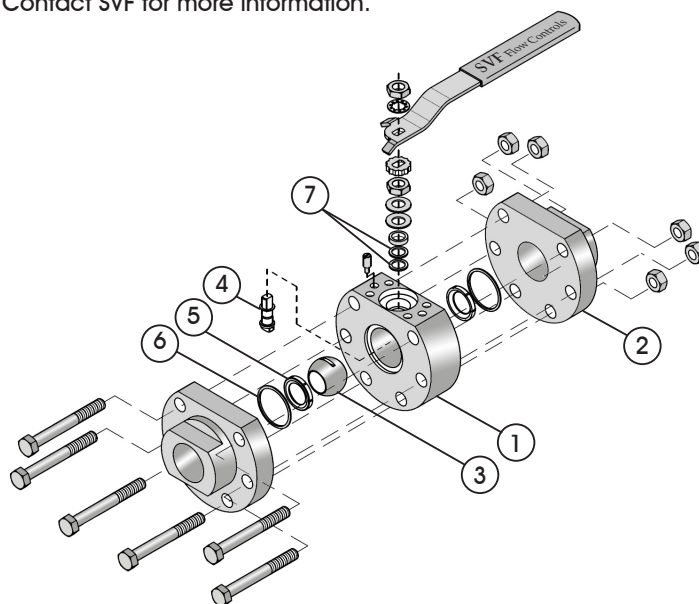
- ✓ High pressure to 6000 psi
- ✓ Live-loaded stem packing ensures seal-tight pressure containment even under thermal cycling
- ✓ Three-piece "swing out" design offers easy access for in-line maintenance
- ✓ Standard seat material is Delrin®
- ✓ Blowout proof stem adds safety & reliability
- ✓ Stainless Steel fasteners and handle



The Series H7 Ball Valve is available with additional options. Contact SVF for more information.

### MATERIALS OF CONSTRUCTION

| ITEM # | DESCRIPTION   | MATERIALS SPECIFICATIONS<br>(Additional options available)             |
|--------|---------------|------------------------------------------------------------------------|
| 1      | Body          | Carbon Steel (ASTM A216 WCB),<br>316 Stainless Steel (ASTM A351 CF8M)  |
| 2      | End Connector | Carbon Steel (ASTM A216 WCB),<br>316L Stainless Steel (ASTM A351 CF3M) |
| 3      | Ball          | 316 Stainless Steel (ASTM A351 CF8M)                                   |
| 4      | Stem          | Stainless Steel 17-4 ph (ASTM A564 630)                                |
| 5      | Seat          | Delrin®, PEEK                                                          |
| 6      | Body Seal     | Buna "N", Viton®, EPDM                                                 |
| 7      | Stem Seal     | SupraLon™                                                              |



### SPECIFICATION STANDARDS OF COMPLIANCE

SVF Series H7 Ball Valves are available in designs that meet the following Industry Standards:

- ANSI
- ASME
- API
- DIN
- ISO
- MSS
- BPE
- NACE
- ASTM

Contact SVF for specific applications

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THROUGH US

Specifications subject to change. Please visit [www.SVF.net](http://www.SVF.net) for the latest updates on this Data Sheet. All Data Sheets posted on our website supersede all prior publications • [Document SVF\_H7\_Data\_Sheet • Series H7 Data Sheet - 01/24/2012]

[www.SVF.net](http://www.SVF.net)

SVF Flow Controls, Inc. • 13560 Larwin Circle • Santa Fe Springs, CA 90670 • Tel: 1.800.783.7836 • FAX: 562.802.3114  
Sales@SVF.net • Visit our website: [www.SVF.net](http://www.SVF.net) • © SVF Flow Controls, Inc. • Specifications subject to change without notice



# Series H7 Ball Valve

## Three-Piece High Pressure Ball Valve

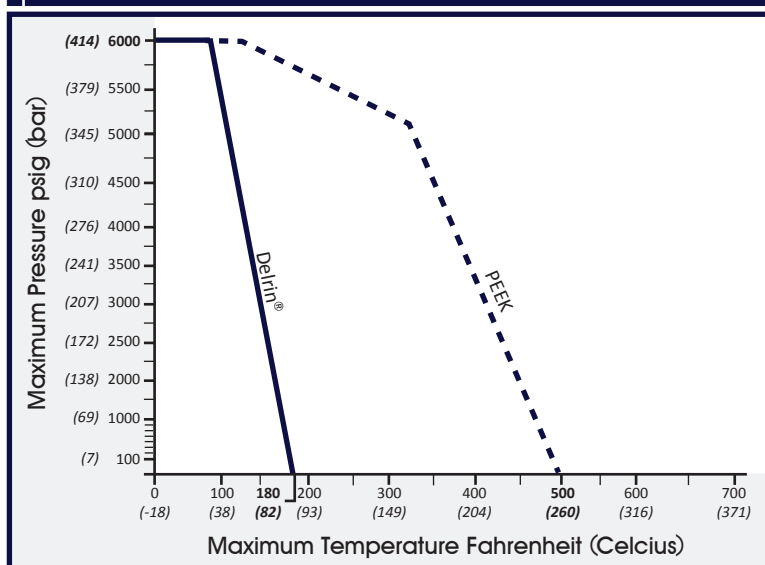
Sizes 1/2" ~ 2"

**H7**

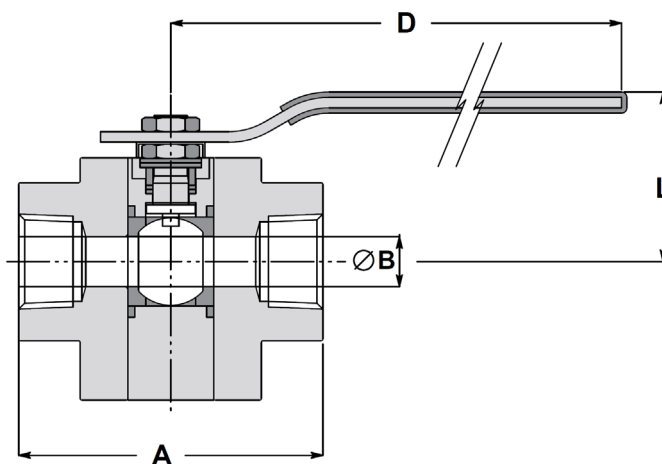
### DIMENSIONS, WEIGHT, CV, TORQUE

| Size   | A    |     | B    |    | D   |     | L   |    | Weight |      | Cv  | Torque* |     |
|--------|------|-----|------|----|-----|-----|-----|----|--------|------|-----|---------|-----|
|        | in.  | mm  | in.  | mm | in. | mm  | in. | mm | lbs    | kg   |     | in-lbf  | Nm  |
| 1/2"   | 2.78 | 71  | 0.44 | 11 | 5   | 127 | 1.8 | 46 | 3.5    | 1.6  | 8   | 60      | 7   |
| 3/4"   | 3.48 | 88  | 0.56 | 14 | 5   | 127 | 1.9 | 48 | 5.3    | 2.4  | 12  | 200     | 23  |
| 1"     | 3.69 | 94  | 0.81 | 21 | 6   | 152 | 2.4 | 61 | 9.9    | 4.5  | 32  | 300     | 34  |
| 1-1/2" | 5.04 | 128 | 1.25 | 32 | 11  | 279 | 3.2 | 81 | 20.9   | 9.5  | 80  | 550     | 62  |
| 2"     | 6.14 | 156 | 1.50 | 38 | 11  | 279 | 3.3 | 84 | 28.9   | 13.1 | 104 | 1100    | 124 |

### H7 - PRESSURE/TEMPERATURE CHART

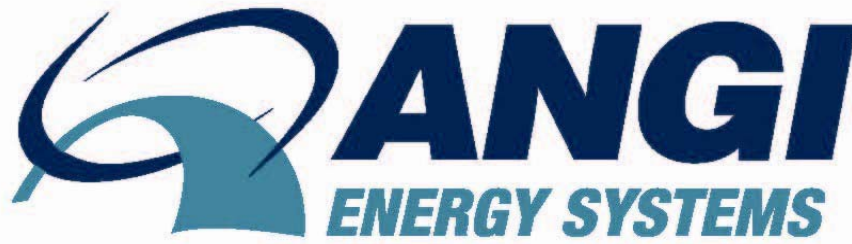


\* At full differential pressure for clean fluids with Delrin® Seats



### HOW TO ORDER SERIES H7 BALL VALVES

| SERIES                                                                                                                                                                                                                                  | BODY & END MATERIAL                                                                                                                                                | BALL & STEM MATERIAL                                                                            | SEAT                                  | BODY SEAL                                                   | ENDS                                                                         | SIZE                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|---------------------------------------|-------------------------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| H7 = Standard Port                                                                                                                                                                                                                      | <b>44</b> = Carbon Steel<br>ASTM A216 WCB<br><br><b>66</b> = Body:<br>316 Stainless Steel<br>ASTM A351 CF8M<br><br>Ends:<br>316L Stainless Steel<br>ASTM A351 CF3M | <b>6M</b> = Ball:<br>316 Stainless Steel<br>ASTM A351 CF8M<br><br>Stem:<br>17-4ph ASTM A564 630 | <b>D</b> = Delrin®<br><b>K</b> = PEEK | <b>B</b> = Buna "N"<br><b>V</b> = Viton®<br><b>E</b> = EPDM | <b>SE</b> =<br>Screwed Ends<br>(FNPT)<br><br><b>SW</b> =<br>Socket Weld Ends | <b>05</b> = 1/2"<br><b>07</b> = 3/4"<br><b>10</b> = 1"<br><b>15</b> = 1-1/2"<br><b>20</b> = 2" |
| <b>Order Example: (H7666MDBSE05)</b><br><br><b>Example Description:</b><br>316 Stainless Steel Body, 316L Stainless Steel Ends, 316 Stainless Steel Ball, 17-4ph Stem, Delrin® Seat, Buna "N" Body Seal, Screwed Ends (FNPT), 1/2" Size |                                                                                                                                                                    |                                                                                                 |                                       |                                                             |                                                                              |                                                                                                |
| H7                                                                                                                                                                                                                                      | 66                                                                                                                                                                 | 6M                                                                                              | D                                     | B                                                           | SE                                                                           | 05                                                                                             |



**PR 13**

MECO  
5648-9717

PRESSURE REGULATOR

ANGI PART NUMBER 500-01674

REBUILD KIT ASSY - MECO PRIMARY REGULATOR – 840-04319

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# NGV REGULATORS & ENVIRO-CAP®

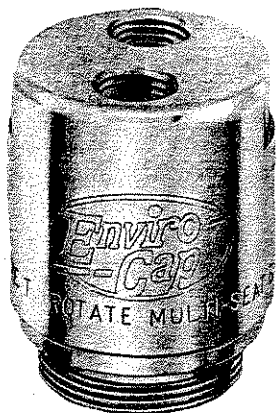
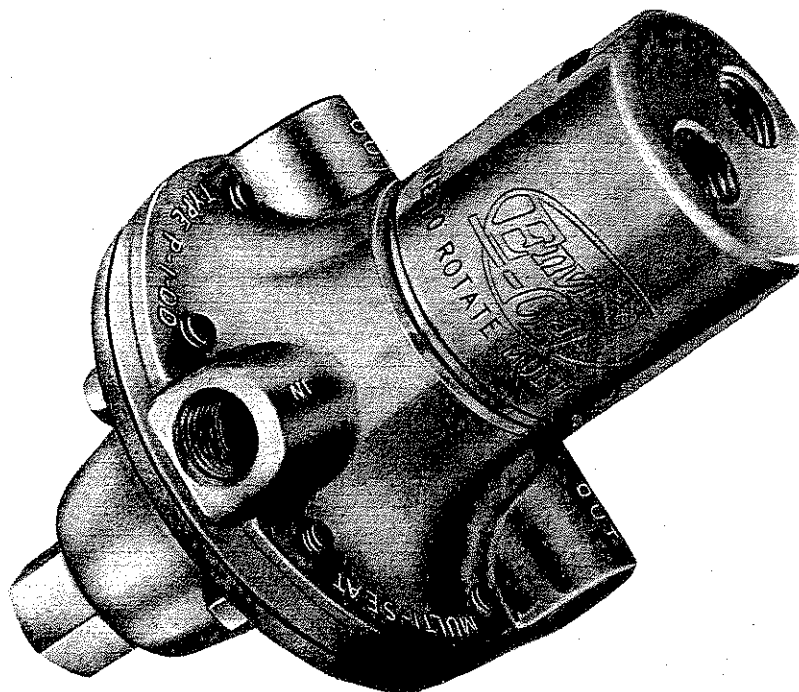
## TYPE "P-NGV"

THE DEPENDABILITY OF THE "YOKE" TYPE REGULATOR IS IDEALLY SUITED AS THE HIGH PRESSURE REGULATOR IN POSITIVE PRESSURE NGV SYSTEMS. RATED FOR INLET PRESSURES TO 5,500 PSI, DELIVERY PRESSURES BETWEEN 2 AND 500 PSI ARE RELIABLY ACHIEVED.

A SPECIAL FEATURE IS THE DIA-BLOK CONSTRUCTION. THE DIAPHRAGM IS CONNECTED TO THE SEAT BLOCK BY MEANS OF A YOKE. THIS ONE PIECE ACTION PROVIDES INSTANT RESPONSE TO VARIATIONS IN DEMAND AND INSURES INSTANTANEOUS AND POSITIVE SHUTOFF.

THE ENVIRO-CAP CAN BE USED TO RETROFIT ANY MECO TYPE "P" REGULATOR WHERE FREEZING AND RESULTING ERRATIC GAS FLOW IS A PROBLEM.

ENGINE COOLANT IS CIRCULATED THROUGH THE BACK CAP TO PREVENT "FREEZE-UP" AND MAINTAIN A UNIFORM GAS FLOW. CONNECTIONS TO THE ENGINE COOLING SYSTEM ARE THROUGH 1/4" NPT PORTS.



### SPECIFICATIONS:

Maximum Inlet Pressure: 5,500 psi

Delivery Pressure Ranges:

| Standard  | Optional  |
|-----------|-----------|
| 0-125 psi | 0-30 psi  |
| 0-150 psi | 0-50 psi  |
| 0-225 psi | 0-500 psi |

Ports:

1/4" NPT Female

Effective Diaphragm Size:

2 1/8" diameter

Materials of Construction:

Body ..... Forged Brass

Bonnet ..... Forged Brass

Diaphragm ... Stainless Steel

Seat ..... Nylon

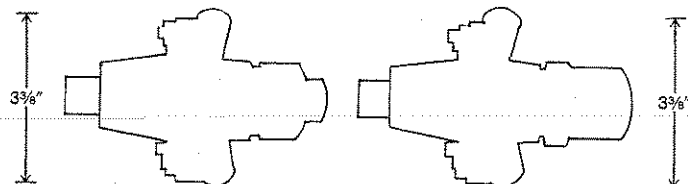
Seals ..... Teflon & SBR

Nozzle ..... Stainless Steel

Inlet Filter ... Sintered Bronze

Options: (at extra cost)

Mounting bolts and nuts

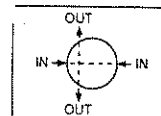


5 5/16"

Standard Type P  
NGV Regulator

5 3/4"

Type P NGV Regulator  
with ENVIRO-CAP



## Ordering Information

PORTING STYLE P-1-DD

| Stock No. | Max. Outlet Pressure                   | Connections   |               | Enviro-Cap | Wt.     |
|-----------|----------------------------------------|---------------|---------------|------------|---------|
|           |                                        | Inlet         | Outlet        |            |         |
| 8429      | 125 psi                                | (2) 1/4" NPTF | (2) 1/4" NPTF | YES        | 3 1/2 # |
| 8431      | 150 psi                                |               |               |            |         |
| 8433      | 225 psi                                |               |               |            |         |
| 8440      | 125 psi                                | (2) 1/4" NPTF | (2) 1/4" NPTF | NO         | 3 1/4 # |
| 8441      | 150 psi                                |               |               |            |         |
| 8442      | 225 psi                                |               |               |            |         |
| 4534      | ENVIRO-CAP, WATER HEATED BACK CAP ONLY |               |               |            |         |

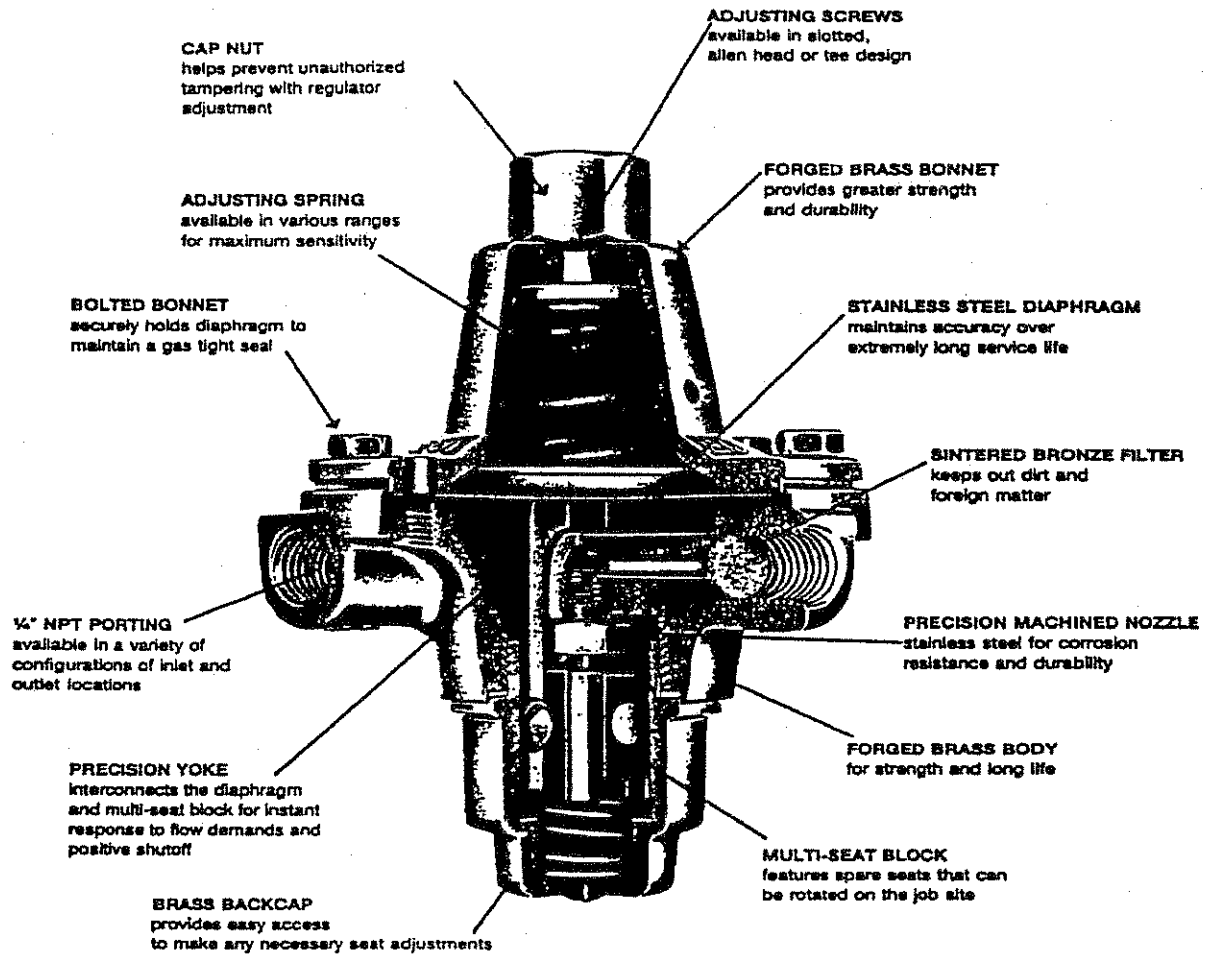
These are MECO's standard models. Additional models with other outlet pressure ranges, other porting and accessories are also available. Please consult with us on your custom regulator application.

MECO Regulators are included in kits certified by A.G.A. and C.A.R.B. MECO Regulators are approved by the Railroad Commission of Texas and are also available with Underwriters Laboratories (UL) Listing. Additional certifications may be applicable; please consult MECO for current listings.

# Control Gas Regulator



## YOKE TYPE REGULATORS



THE TYPE P HIGH PRESSURE REGULATORS . . . fill numerous needs throughout industry. Time proven for reliability and service, these regulators are designed around the special DIA-BLOCK feature. The diaphragm and seat block are directly connected by a precision machined YOKE. Any action on the diaphragm is instantly transmitted to the seat. The results being a high degree of sensitivity and accuracy.

MULTI-SEAT BLOCK . . . contains four seating surfaces which can be easily revolved as needed. No special tools are required to make this change. Various seating materials are available



| STN | REF.        | DATE  | STN | REF. | DATE  | STN | REF. | DATE |
|-----|-------------|-------|-----|------|-------|-----|------|------|
| A   | E514        | 9-99  | C   | E572 | 12/99 |     |      |      |
|     | REV & REDWN |       | D   | E605 | 01-00 |     |      |      |
| B   | E516        | 10-99 |     |      |       |     |      |      |

# TEST PROCEDURE MECO PRESET REGULATORS

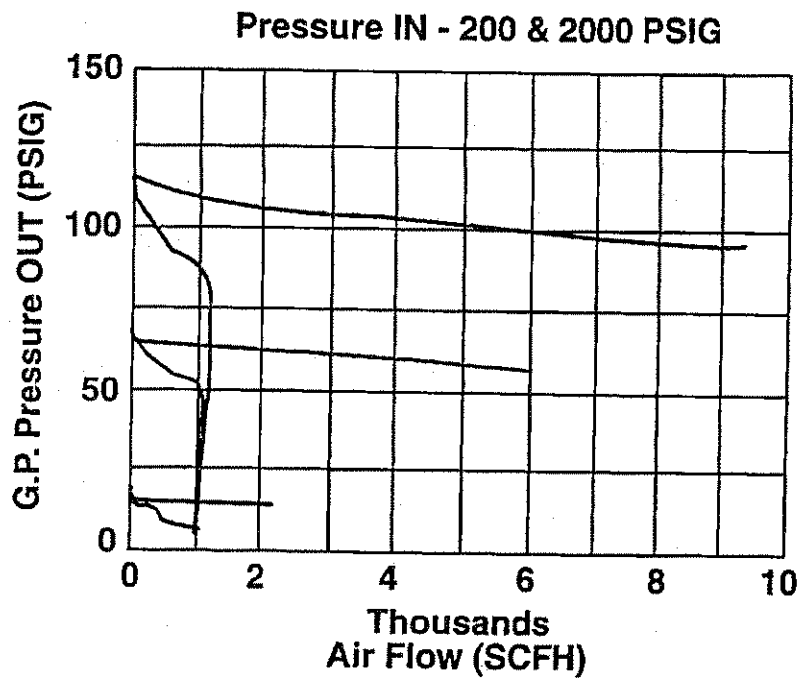
1. INSTALL A TEST GUN WITH A #52 (.0835) ORIFICE TO REGULATOR OUTLET. USE A J PSIG OUTLET GAUGE FOR TESTS.
2. PRESSURIZE THE REGULATOR WITH A PSIG OF OIL FREE AIR OR DRY NITROGEN.
3. LEAK TEST: ADJUST THE REGULATOR TO DELIVER H PSIG. CLOSE THE INLET VALVE AND TURN THE ADJUSTING SCREW ONE TURN COUNTER CLOCKWISE. OBSERVE BOTH GAUGES FOR 5 MINUTES. NO CHANGE IN EITHER GAUGE READING IS PERMITTED. A LEAK TEST MAY BE PERFORMED BY OTHER MEANS PROVIDED THE LEAK RATE USING AIR DOES NOT EXCEED K PER MINUTE.
4. DROP TEST: ADJUST THE REGULATOR TO DELIVER H PSIG STATIC. OPEN THE TEST GUN. THE DROP ON THE OUTLET TEST GAUGE MUST NOT EXCEED L PSIG.
5. SLOW SHUT-OFF/CREEP TEST: ADJUST THE REGULATOR TO DELIVER H PSIG FLOWING. CLOSE THE TEST GUN AND OBSERVE THE DELIVERY PRESSURE READING FOR 5 MINUTES. AN INITIAL SLOW SHUT-OFF INCREASE OF M PSIG DURING THE FIRST MINUTE IS PERMISSIBLE. NO FURTHER CREEP IS PERMISSIBLE DURING THE NEXT 4 MINUTES.
6. PRESET THE REGULATOR TO N PSIG STATIC.

| A                     | H                             | J                        | K         | L         | M          | N               | PROC.<br>NUMBER |
|-----------------------|-------------------------------|--------------------------|-----------|-----------|------------|-----------------|-----------------|
| TEST PRESSURE<br>PSIG | PRESSURE SETTING<br>FOR TESTS | PRESS. GAUGE<br>FOR TEST | LEAK TEST | DROP TEST | CREEP TEST | FINAL<br>PRESET |                 |
|                       |                               |                          |           |           |            |                 |                 |
|                       |                               |                          |           |           |            |                 |                 |
| 3600±200              | 225 PSIG                      | 400 PSIG                 | 10 SCC    | 15 PSIG   | 3 PSIG     | 225±5 PSIG      | 111             |
| 3600±200              | 125 PSIG                      | 200 PSIG                 | 10 SCC    | 10 PSIG   | 3 PSIG     | 125±5 PSIG      | 112             |
| 3600±200              | 50 PSIG                       | 100 PSIG                 | 10 SCC    | 5 PSIG    | 3 PSIG     | 50±3 PSIG       | 113             |
| 3600±200              | 150 PSIG                      | 200 PSIG                 | 10 SCC    | 10 PSIG   | 3 PSIG     | 150±5 PSIG      | 114             |
| 3600±200              | 40 PSIG                       | 100 PSIG                 | 10 SCC    | 5 PSIG    | 3 PSIG     | 40 ±5 PSIG      | 115             |
| 3600±200              | 35 PSIG                       | 100 PSIG                 | 10 SCC    | 5 PSIG    | 3 PSIG     | 35 ±5 PSIG      | 116             |
| 3600±200              | 60 PSIG                       | 100 PSIG                 | 10 SCC    | 5 PSIG    | 3 PSIG     | 60 ±3 PSIG      | 117             |
|                       |                               |                          |           |           |            |                 |                 |
|                       |                               |                          |           |           |            |                 |                 |
|                       |                               |                          |           |           |            |                 |                 |
|                       |                               |                          |           |           |            |                 |                 |

|                                                                                                                                                                                                                                                                                                                                                                               |  |                                                                        |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------|--|
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| <p>REF. DATA</p> <p>70420</p>                                                                                                                                                                                                                                                                                                                                                 |  | <p><b>MATERIAL</b></p> <p>FINISH</p>                                   |  |
| <p><b>TOLERANCE SPECIFIER</b></p> <p>MEAN ALL DIMS. .015-.018<br/>MACHINED SURFACES .125<br/>ALL FEATURES WITH A COMMON ANGLE<br/>MOST OR CHAINED WITHIN .005 P.I.A.B.<br/>TOLERANCES .1 .020 .010 .005<br/>X .005 .003 .002 .001<br/>X .005 .003 .002 .001<br/>X .005 .003 .002 .001</p>                                                                                     |  | <p><b>DRAWN BY</b> DATE<br/>E. BRADFORD 10-22-88</p>                   |  |
| <p><b>CHECKED</b> L. TURNER 11-89</p>                                                                                                                                                                                                                                                                                                                                         |  | <p><b>TITLE</b></p> <p>TEST PROCEDURE</p>                              |  |
| <p><b>APVD</b></p>                                                                                                                                                                                                                                                                                                                                                            |  | <p><b>MECO PRESET REGULATORS</b></p>                                   |  |
| <p><b>SIZE</b> B</p>                                                                                                                                                                                                                                                                                                                                                          |  | <p><b>UNP. NO.</b> 0080-0040</p>                                       |  |
| <p><b>DIMENSIONS ARE IN INCHES UNLESS NOTED</b></p>                                                                                                                                                                                                                                                                                                                           |  | <p><b>SCALE</b> NTS</p>                                                |  |
| <p><b>SHEET 2 OF 2</b></p>                                                                                                                                                                                                                                                                                                                                                    |  | <p><b>SHEET 2 OF 2</b></p>                                             |  |

# Flow Data (SCFH)

## Meco "P" Series Cylinder Regulator Single Stage/Heavy Duty



Reference: "P" Regulator Section A, Page 37

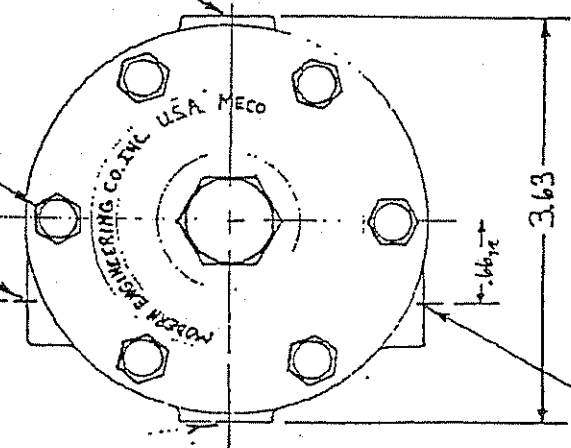
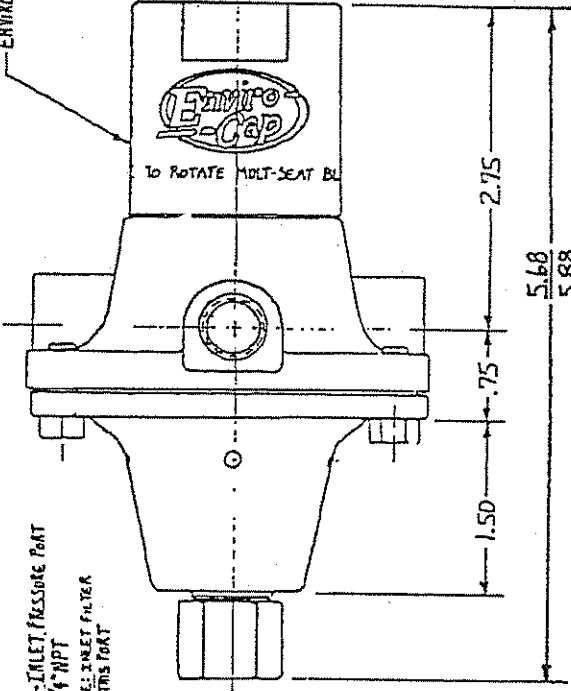
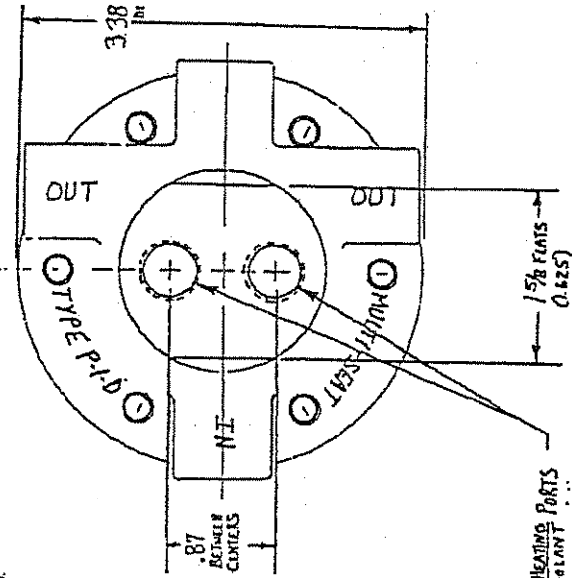
OUTLET MEASURE PORT  
1/4" NPT

— BONNET SCREW (6 REQ'D) — (NOTE: SET SCREW NOT CAN  
EQUALLY SPACED ON 2.75 IN. BOLT CIRCLE — ALSO BE USED — SEE ATTACHED)  
1/4-20 UNC TH'D. — 3/8 IN. X HEAD

— INLET/OUTLET OPT. FLUID  
PRESSURE PORT — 1/4" NPT

— ENVIRO-CAP<sup>®</sup> —

INLET PRESSURE PORT  
1/4" NPT  
NOTE: INLET FILTER  
IN THIS PORT



314

WEIGHT - 3.5 LB. APPROX.

INSTALLATION DWG. ("P" NGV)

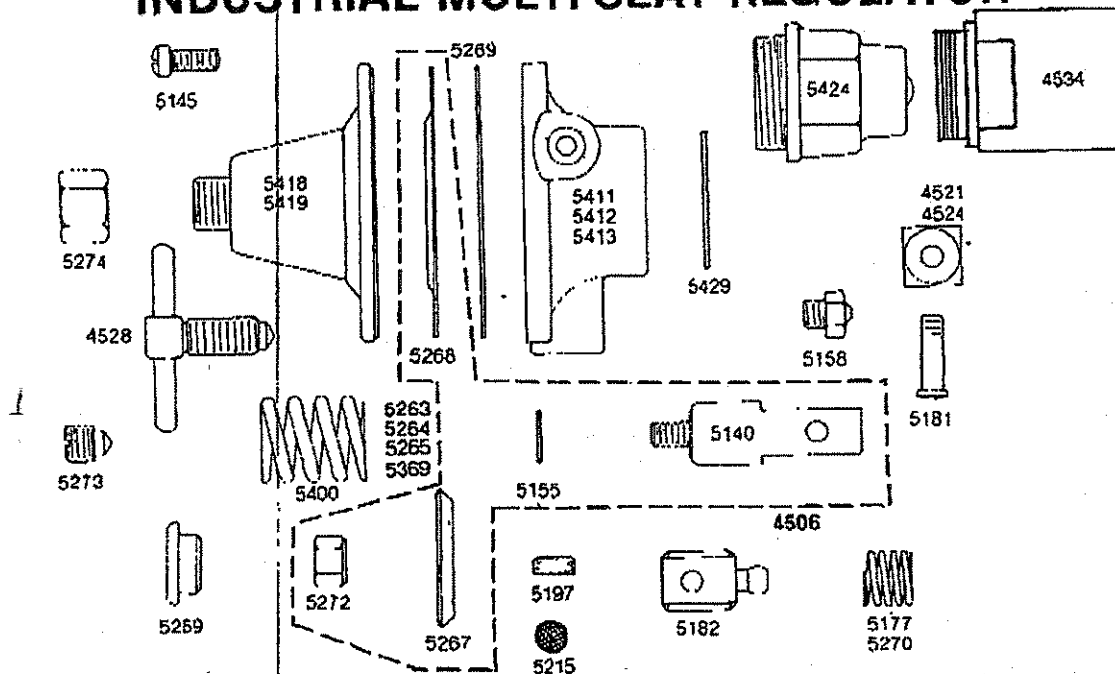
|                                                                  |              |
|------------------------------------------------------------------|--------------|
| MODERN ENGINEERING COMPANY<br>GALLIUM, MS • ST. LOUIS, MO U.S.A. |              |
| SUBJECT TYPE "P" NGV REGULATOR                                   | DATE 6-25-91 |
| DRAWN WFF                                                        | CHECKED BY   |
| SCALE FULL (APPROX.)                                             |              |

ALL DIMENSIONS IN INCHES  
TOLERANCE  
1 PLACE DECIMAL AND FRACTIONAL DIMENSIONS ± .03  
3 PLACE DECIMAL DIMENSIONS ± .001  
UNLESS OTHERWISE SPECIFIED  
UNLESS OTHERWISE SPECIFIED

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## TYPE P-30, P-50, P-125, P-150, & P-225 INDUSTRIAL MULTI-SEAT REGULATOR

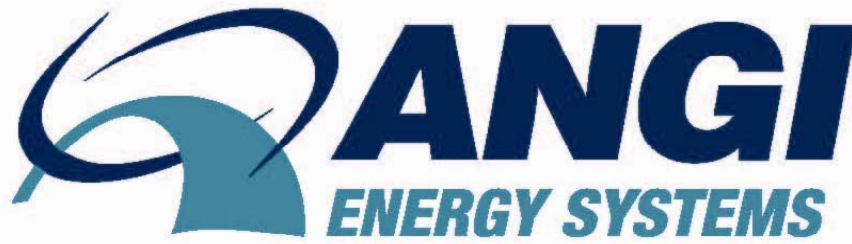


### Stock No.

### Description

|      |                                                              |
|------|--------------------------------------------------------------|
| 4506 | Diaphragm-Yoke Assembly .....                                |
| 4521 | Seat Block with White Nylon Seats .....                      |
| 4524 | Seat Block with Kel-F Seats for CO <sub>2</sub> .....        |
| 4528 | Adjusting Screw Assembly .....                               |
| 4534 | ENVIRO-CAP, Water Heated Back Cap Assembly .....             |
| 5140 | Yoke (Part of 4506) .....                                    |
| 5145 | Bonnet Screw 6 required, Pkg. 12 .....                       |
| 5155 | Yoke Gasket, Teflon, Pkg. 12 (Part of 4506) .....            |
| 5158 | Nozzle with 5/84" Orifice, Pkg. 6 .....                      |
| 5177 | Rear Spring, for over 500 PSI Inlet Pressure, Standard ..... |
| 5181 | Yoke Clamping Screw, Pkg. 6 .....                            |
| 5182 | Yoke Guide .....                                             |
| 5197 | Filter Screen, pkg. 6 .....                                  |
| 5215 | Sintered Filter, pkg. 12, Standard .....                     |
| 5259 | Spring Button .....                                          |
| 5263 | Compression Spring for 30 PSI Pressure (Red) .....           |
| 5264 | Compression Spring for 125 PSI Pressure (Green) .....        |
| 5265 | Compression Spring for 150 PSI pressure (Purple) .....       |
| 5267 | Diaphragm Plate (Part of 4506) .....                         |
| 5268 | Stainless Steel Diaphragm (Part of 4506) .....               |
| 5269 | Diaphragm Gasket, Pkg. 6 .....                               |
| 5272 | Diaphragm Plate Nut (Part of 4506) .....                     |
| 5273 | Slot Type Adjusting Screw .....                              |
| 5274 | Protection Cap for Slot Adjusting Screw .....                |
| 5369 | Compression Spring for 50 PSI pressure (Black) .....         |
| 5400 | Compression Spring for 225 PSI pressure (Grey) .....         |
| 5411 | Body, 1 inlet, 2 outlets P-1-DA .....                        |
| 5412 | Body, 1 inlet, 3 outlets P-1-DC .....                        |
| 5413 | Body, 2 inlets, 2 outlets P-1-DD .....                       |
| 5418 | Bonnet, for "T" Type Adjusting Screw .....                   |
| 5419 | Bonnet, for Slotted Type Adjusting Screw .....               |
| 5423 | Allen Head Adj. Screw .....                                  |
| 5424 | Back Cap .....                                               |
| 5429 | Back Cap Gasket, Teflon, Pkg. 12 .....                       |

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**PT 50**

AMERICAN SENSOR TECHNOLOGIES (AST)  
AST4400A06000P4E0437  
0-6000 PSI PRESSURE TRANSDUCER, IS/UL  
CL1 DIV2, GROUPEC&D, 4-20Ma, 1/4MNPT, SS

ANGI PART NUMBER 410-07282

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# AST4400 *Stainless Steel Media Isolated Pressure Sensor*

**CSA Approved For Hazardous Locations with Approved Barrier** 



## Overview

The AST4400 is a media isolated stainless steel pressure sensor with a wide variety of options. In addition to its rugged construction and best price-to-performance ratio in the industry, the AST4400 is the solution for pressure measurement in Intrinsically Safe areas.

## Benefits

- **ANSI/ISA - 12.27.01.2003 Certified "Single Seal"**  
(No need for expensive secondary seal)
- **CSA 157 Class 1** Groups C, D IS with approved Barrier (page 2)
- **CAN/CSA-C22.2 No. 157.92** - Intrinsically Safe and Non-Incendive Equipment for Use in Hazardous Locations
- High Strength Stainless Steel Construction
- No Oil, Welds or Internal O-rings
- Wide Operating Temperature Range
- Ranges up to 10,000 PSI
- Low Static and Thermal Errors
- Unparalleled Price and Performance
- Compatible with Wide Range of Liquids and Gases
- EMI/RFI Protection
- 500VAC Isolation

## Applications

- Industrial OEM Equipment
- Water Management
- Pneumatics
- Hydrogen Storage (316L SS)
- HVAC/R Equipment
- Control Panels
- Hydraulic Systems
- Data Loggers

## Performance @25°C (77°F)

|                       |                                      |
|-----------------------|--------------------------------------|
| Accuracy*             | < ±0.25% BFSL                        |
| Stability (1 year)    | ±0.25%FS, typical                    |
| Over range Protection | 2X Rated Pressure                    |
| Burst Pressure        | 5X or 20,000 PSI (whichever is less) |
| Pressure Cycles       | > 100 Million                        |

\* Accuracy includes non-linearity, hysteresis & non-repeatability



**Krystal Bond**  
Technology  
by AST

## Environmental Data

### Temperature

|           |                             |
|-----------|-----------------------------|
| Operating | -40 to 85°C (-40 to 185°F)  |
| Storage   | -40 to 100°C (-40 to 212°F) |

### Thermal Limits

|                   |                         |
|-------------------|-------------------------|
| Compensated Range | 0 to 55°C (30 to 130°F) |
| TC Zero           | <±1.5% of FS            |
| TC Span           | <±1.5% of FS            |

### Other

|                    |                          |
|--------------------|--------------------------|
| Shock              | 100G, 11 msec, 1/2 sine  |
| Vibration          | 10G peak, 20 to 2000 Hz. |
| EMI/RFI Protection | Yes                      |
| Rating             | IP-66                    |

## Electrical Data

| Output                      | 4-20mA               | 1-5VDC, 1-6VDC     | 0-50mV (10mV/V)         | 0.5-4.5V Ratiometric |
|-----------------------------|----------------------|--------------------|-------------------------|----------------------|
| Excitation                  | 10-28VDC             | 10-28VDC           | 5VDC, typical           | 5VDC, regulated      |
| Output Impedance            | >10k Ohms            | <100 Ohms, Nominal | 1100 Ohms, Nominal      | <100 Ohms, Nominal   |
| Current Consumption         | 20mA, typical        | <10mA              | <5mA                    | <10mA                |
| Bandwidth                   | (-3dB): DC to 250 Hz | (-3dB): DC to 1kHz | (-3dB): DC to 5kHz, min | (-3dB): DC to 1kHz   |
| Output Noise                | -                    | <2mV RMS           | -                       | <2mV RMS             |
| Zero Offset:                | <±1% of FS           | <±1% of FS         | < ±2% of FS             | <±1% of FS           |
| Span Tolerance              | <±2% of FS           | <±1.5% of FS       | < ±2% of FS             | <±1.5% of FS         |
| Output Load                 | 0-800 Ohms@10-28VDC  | 10k Ohms, Min.     | >1M Ohms                | 10K Ohms, Min.       |
| Reverse Polarity Protection | Yes                  | Yes                | -                       | No                   |

## Ordering Information

**AST4400** **A** **00500** **P** **4** **E** **0** **000** **-SS**

**Series Type**

**Process Connection**  
A=1/4" NPT Male  
B=1/8" NPT Male  
C=1/4" BSPP Male  
F=7/16" - 20 UNF Male  
I= 1/4" NPT Female

**Pressure Range**  
Insert pressure range from chart

**Pressure Unit**  
B= Bar  
K= kg/cm<sup>2</sup>  
P= PSI

**Outputs**  
1= 0.5-4.5V ratiometric 6= 1-6V  
3= 1-5V A= 0-50mV (10mV/V)  
4= 4-20mA (2 wire loop powered)

**Electrical** F= Packard Metripack 150 3-Pin Conn.  
A= 2 ft. (0.6 m) I= DIN 43650A  
B= 4 ft. (1.2 m) L= Conduit fitting, Cable 2 ft.  
C= 6 ft. (1.8 m) M= Conduit fitting, Cable 4 ft.  
D= 10 ft. (3.0 m) N= Conduit fitting, Cable 6 ft.  
E= Mini DIN 43650 P= Conduit fitting, Cable 10 ft.

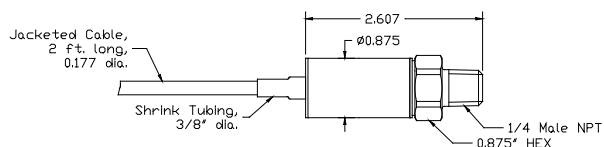
**Wetted Material**  
0=17-4PH  
1=316 L

**Options**  
000 -No special options

**Single Seal**

**Now With DIN43650A!**

## Dimensional Data

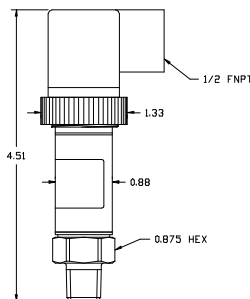


### DIN43650A

| Output     | Pin 1     | Pin 2  | Pin 3    | Wide Pin |
|------------|-----------|--------|----------|----------|
| 4-20mA     | +V Supply | Ground | Case GND | N/C      |
| 3W Voltage | +V Supply | Ground | + Signal | Case GND |

### CABLE

| Output     | Red       | Black  | White    | Green    |
|------------|-----------|--------|----------|----------|
| 4-20mA     | +V Supply | Ground | N/C      | Case GND |
| 3W Voltage | +V Supply | Ground | + Signal | Case GND |



## Warranty

**Workmanship** - AST, Inc. pressure transmitters have a limited one-year warranty to the original purchaser. AST, Inc. will replace or repair, free of charge, any defective transmitter. This warranty does not apply to any units that have been modified; misused, neglected or installed where the application exceeds published ratings. AST's sensors are made with pride in New Jersey, USA. If in the area please feel free to stop by for a visit!

**Installation/Applications** - The purchaser is responsible for media compatibility, functional adequacy, and correct installation of the transmitter.

## Pressure Ranges\*

| PSIG Measurement Range | Pressure Range Code | BARG Measurement Range | Pressure Range Code |
|------------------------|---------------------|------------------------|---------------------|
| -14.7 to 25**          | V0025**             | -1 to 2**              | V0002**             |
| 0-25                   | 00025               | 0-2                    | 00002               |
| 0-50                   | 00050               | 0-5                    | 00005               |
| 0-100                  | 00100               | 0-10                   | 00010               |
| 0-200                  | 00200               | 0-20                   | 00020               |
| 0-500                  | 00500               | 0-50                   | 00050               |
| 0-1,000                | 01000               | 0-100                  | 00100               |
| 0-2,500                | 02500               | 0-250                  | 00250               |
| 0-5,000                | 05000               | 0-350                  | 00350               |
| 0-7,500                | 07500               | 0-500                  | 00500               |
| 0-10,000               | 10000               | 0-700                  | 00700               |

\*Typical ranges. All ranges between 0-25 PSI and 0-10,000 PSI available.

\*\*Compound ranges up to -14.7 to 2500 PSI available. Please consult factory.

## Barrier Installation

Class I, Div. 1, Groups C, D  
Hazardous Location  
Nonhazardous Location  
A08949

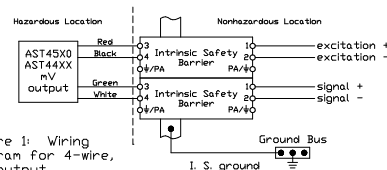


Figure 1: Wiring diagram for 4-wire, mV output

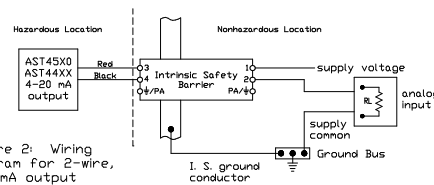


Figure 2: Wiring diagram for 2-wire, 4-20mA output

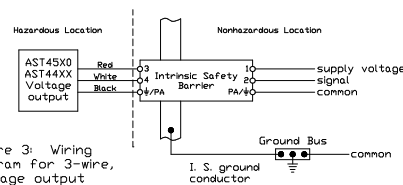


Figure 3: Wiring diagram for 3-wire, Voltage output

### Entity Parameters

Models AST4400, AST4410 and AST44LP

V<sub>max</sub> = 28 Vdc  
I<sub>max</sub> = 175 mA  
C<sub>i</sub> = 0.45 uF  
L<sub>i</sub> = 0

Models AST4400, AST4410 and AST44P with integral cable

V<sub>max</sub> = 28 Vdc  
I<sub>max</sub> = 175 mA  
C<sub>i</sub> = 0.45 uF  
L<sub>i</sub> = 1.32 uH

Models AST4500, AST4510 and AST4520

V<sub>max</sub> = 28 Vdc  
I<sub>max</sub> = 175 mA  
C<sub>i</sub> = 0.45 uF  
L<sub>i</sub> = 16.5 uH

1. For installation in accordance with Fig. 2, barrier must be a CSA Certified, Single Channel grounded Shunt-Diode Zener Barrier or a Single Channel Isolating Barrier.

Barrier parameters must meet the following requirements:

$$V_{oc} \text{ or } U_o \leq V_{max} \quad C_a \text{ or } C_o \geq C_i + C_{cable}$$

$$I_{sc} \text{ or } I_o \leq I_{max} \quad L_a \text{ or } L_o \geq L_i + L_{cable}$$

$$P_o \leq P_i \text{ (if applicable)}$$

2. For installations in accordance with Figs. 1 and 3, one dual-channel or two single-channel barriers may be used, where in either case, both channels have been Certified for use together with combined entity parameters.

The following conditions must be satisfied:

$$V_{oc} \text{ or } U_o \leq V_{max} \quad C_a \text{ or } C_o \geq C_i + C_{cable}$$

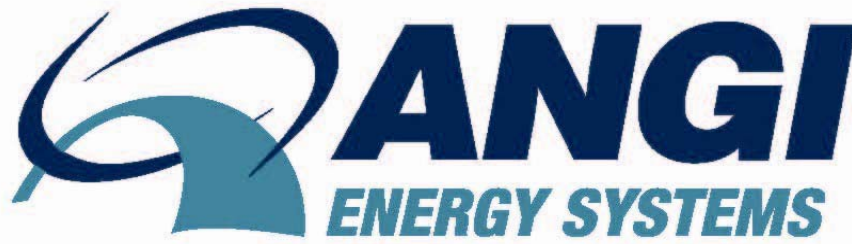
$$I_{sc} \text{ or } I_o \leq I_{max} \quad L_a \text{ or } L_o \geq L_i + L_{cable}$$

$$P_o \leq P_i \text{ (if applicable)}$$

3. Maximum non-hazardous area voltage must not exceed 250 V.

4. Installation should be in accordance with Canadian Electrical Code, Part I.

5. A grounding method is not provided by the manufacturer as part of the integral design of the Transducer. For units which are connected through a grounded shunt diode safety barrier, ensure that the transducer is mounted to a surface which is at the same potential as the barrier ground.



**SRV 37**

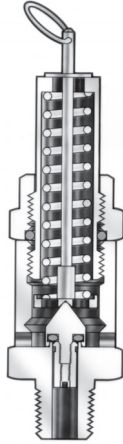
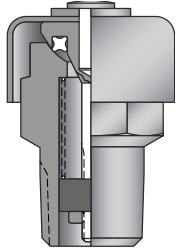
CIRCLE SEAL  
D559N-2M-125 ASME

125 PSI 1/4" ASME, SAFETY RELIEF VALVE

ANGI PART NUMBER 991-07663

NO REBUILD KIT AVAILABLE

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 **CIRCLE SEAL CONTROLS, INC.**  
A division of CIRCOR International, Inc.

## **D500 Series 15 to 150 PSIG**

## **M5100 Series 20 to 1200 PSIG**

### **ASME Safety Relief Valves**

### **Features**

- D500 Features Cap Design
- M5100 Offered with Ring or Lift Handle
- MD500 Features Cup Design with Manual Override Ring.

### **Technical Data**

|                              |                                                                                                                                                                                 |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ASME                         | <ul style="list-style-type: none"> <li>• American Society of Mechanical Engineers</li> </ul>                                                                                    |
| Body Construction Materials: | <ul style="list-style-type: none"> <li>• D500 – Naval Brass or 316 Stainless Steel</li> <li>• M5100 – Naval Brass or 316 Stainless Steel</li> </ul>                             |
| O-ring Materials:            | <ul style="list-style-type: none"> <li>• M5100 – Buna N, Neoprene, Teflon®, Viton®, and EPDM</li> <li>• D500 – Buna N, Neoprene, Teflon®, Viton®, EPDM, and silicone</li> </ul> |
| Set Pressure:                | <ul style="list-style-type: none"> <li>• D500 – 15 to 150 PSIG 1/4"</li> <li>• M5100 – 20 to 1,200 PSIG 1/8", 3/4", 1" 50 to 1,200 PSIG 1/4", 3/8", 1/2"</li> </ul>             |
| Temperature Range:           | <ul style="list-style-type: none"> <li>• -100° F to +400° F (-73° C to 204° C)</li> <li>Based on o-ring material, see "How to Order"</li> </ul>                                 |
| Connection Sizes:            | <ul style="list-style-type: none"> <li>• D500 – 1/4" Male Pipe</li> <li>• M5100 – 1/8" to 1" Male Pipe</li> </ul>                                                               |

### **Terminology For ASME Safety Relief Valves**

#### **SAFETY RELIEF VALVES**

An automatic pressure relieving device actuated by the static pressure upstream of the valve, which opens in proportion to the increase in pressure over the opening pressure.

#### **START-TO-LEAK PRESSURE**

The pressure at the valve inlet where the relieved fluid is first detected (on the down-stream side of the seat) before normal relieving action takes place.

#### **OPENING PRESSURE (SET PRESSURE)**

The valve inlet pop point pressure at which there is a measurable lift or discharge becomes continuous as determined by seeing, hearing or feeling. In the pop type of safety valve, it is the inlet pressure at which the valve opens, allowing a larger amount of fluid as compared with corresponding valve movements at higher or lower pressures.

NOTE: A safety relief valve is not considered to open when it is simmering at a pressure just below the popping point even though the simmering may be audible. This set pressure distinguishes our ASME relief valves from our standard relief valves whose cracking pressure indicates initial flow.

#### **RELIEVING PRESSURE**

(Opening Pressure plus Overpressure) The pressure measured at the valve inlet at which the relieving capacity is determined.

#### **CLOSING PRESSURE**

(Reset Pressure) The pressure measured at the valve inlet, at which the valve closes, flow is substantially shut off, and there is no measurable lift.

#### **SEAL-OFF PRESSURE**

The pressure (measured at the valve inlet) after closing at which no further gas is detected at the down-stream side of the seat.

#### **OPERATING PRESSURE**

The actual pressure at which a vessel is maintained in normal operation.

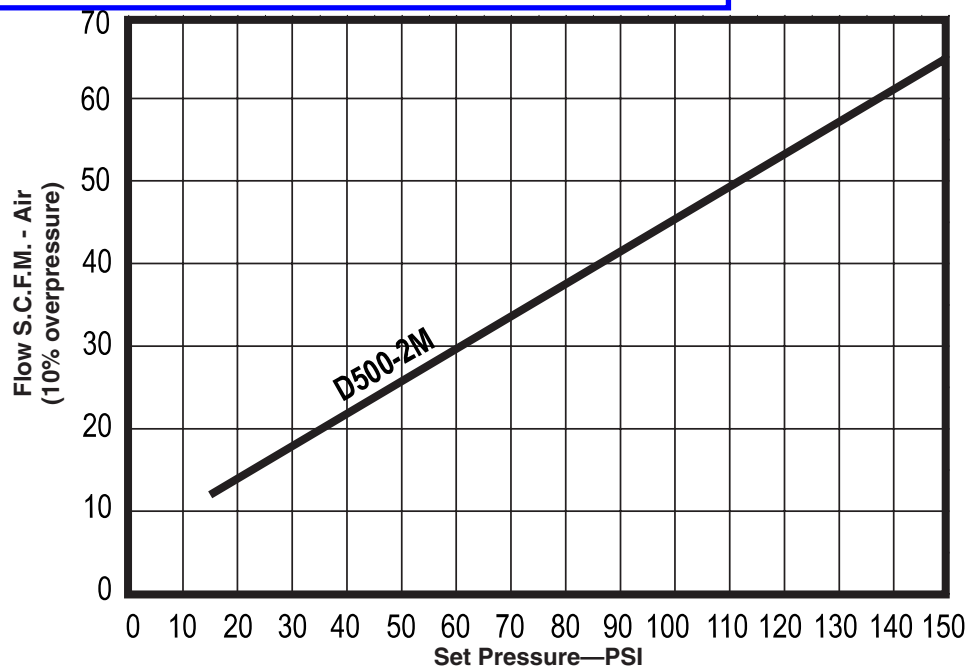
#### **ACCUMULATION**

Pressure build-up or overpressure beyond the set pressure of a safety relief valve, at which capacity flow is rated. Capacities are usually based on 10% accumulation.

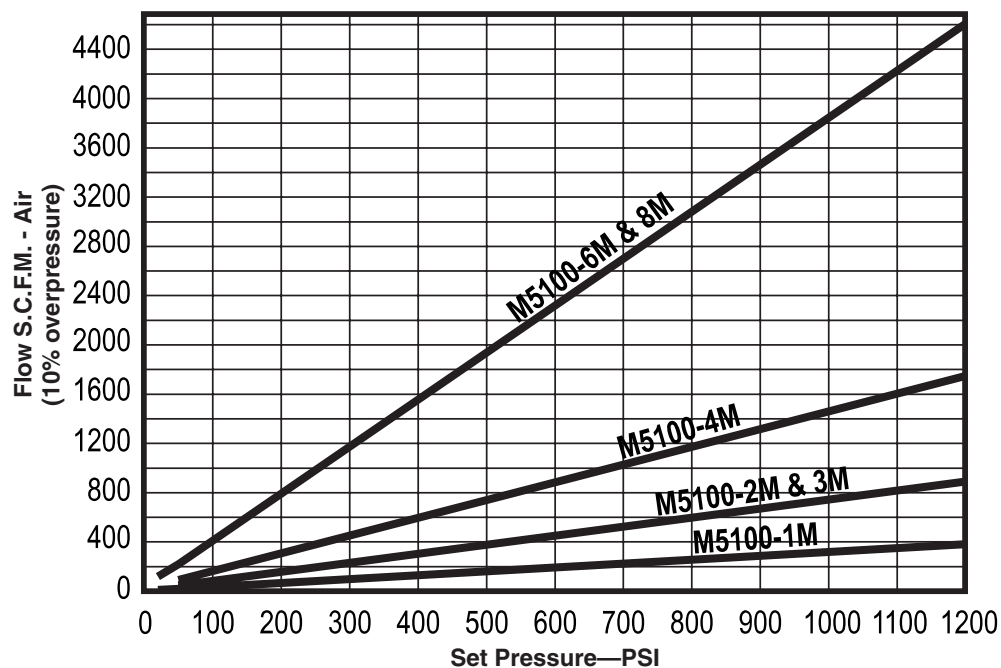
NOTE: Proper filtration is recommended to prevent damage to sealing surfaces.

**D500 Series 15 to 150 PSIG**  
**M5100 Series 20 to 1200 PSIG**  
**ASME Safety Relief Valves**

**Flow Curve D500 Series ASME Safety Relief Valve**



**Flow Curve M5100 Series ASME Safety Relief Valve**



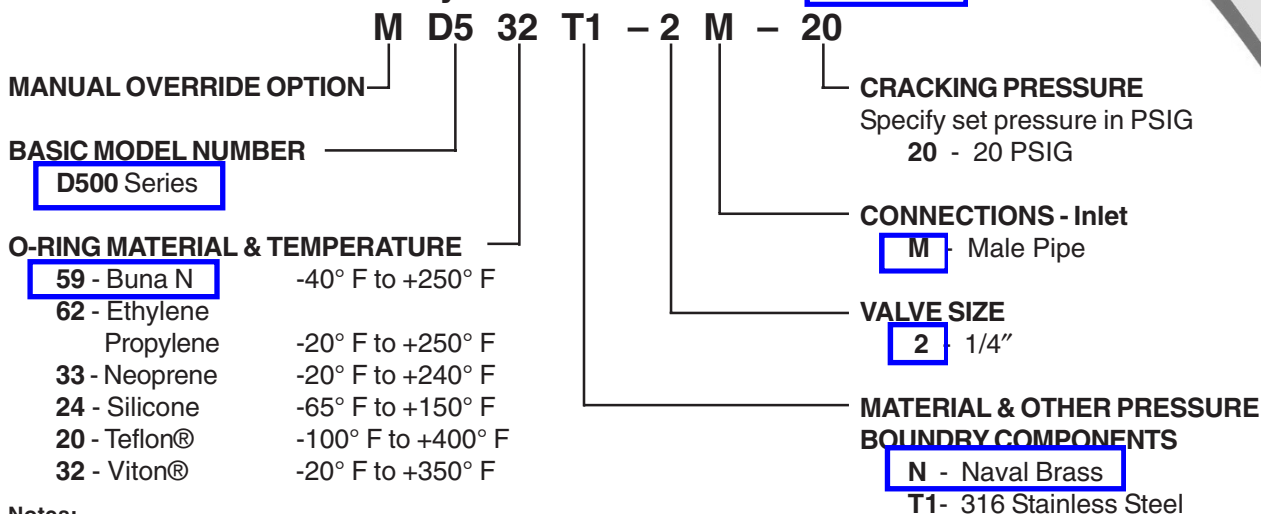
# D500 Series 15 to 150 PSIG

## M5100 Series 20 to 1200 PSIG

### ASME Safety Relief Valves

#### How to Order

#### D500 Series ASME Safety Relief Valve—15 to 150 PSI



#### Notes:

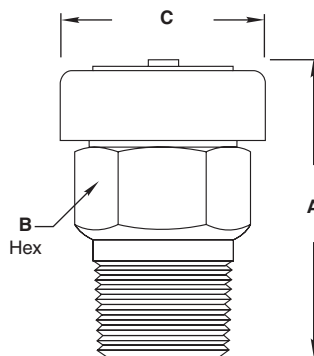
Teflon® is a registered trademark of DuPont.

Viton® is a registered trademark of DuPont Dow Elastomers.

Please consult your Circle Seal Controls Distributor or our factory for information on special connections, lubricants, operating pressures and temperature ranges.

#### Dimensions (Inches)

| Dash No. | Size | A     | B Hex | C Dia |
|----------|------|-------|-------|-------|
| 2M       | 1/4" | 1.375 | .625  | .90   |



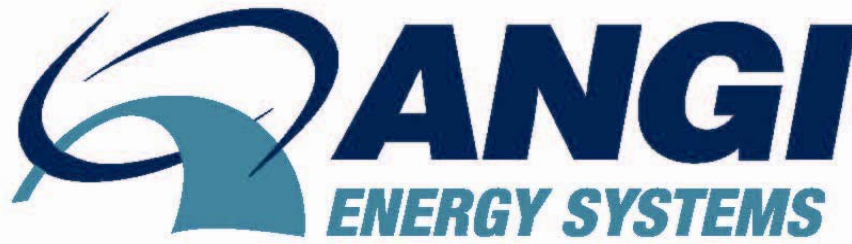
#### Recommended Installation

- 1 Before installing a new safety relief valve, we recommend that a pipe tap be used to assure clean-cut and uniform threads in the vessel opening and to allow for normal hand engagement followed by a half to one turn by wrench.
- 2 Avoid over-tightening as this can distort the valve seat.
- 3 Avoid excess "popping" of the valve. Safety relief valves should only be operated often enough to assure they are in good working order.
- 4 Apply only a moderate amount of pipe compound or tape to the threads, leaving the first thread clean parts.
- 5 Don't oversize the valve, as this may cause chatter resulting in rapid wear of the moving parts.
- 6 Avoid wire, cable or chain pulls for attachments to levers that do not allow a vertical pull. The weight of these devices should not be applied to the safety relief valve.
- 7 Avoid having the operation pressure too near the valve set pressure. A minimum differential of 10% is recommended.

#### For Your Safety

*It is the sole responsibility of the system designer and user to select products suitable for their specific application requirements and to ensure proper installation, operation and maintenance of these products. Material compatibility product ratings and application details should be considered in the selection. Improper selection or use of products described here in can cause personal injury or property damage.*

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**SV 9**

ASCO  
EF8320G184-120/60

1/4" 3-WAY, 120V, 150 PSI SOLENOID VALVE

ANGI PART NUMBER 330-07243

REBUILD KIT- ASCO 3-WAY SOLENOID 120V 150 PSI – 761-07358

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## Features

- All NPT connections are in the valve body to allow in-line piping.
- No Minimum Operating Pressure Differential required.
- Sturdy design for long years of reliable service.
- Broadest range of applications.
- Mountable in any position.

## Construction

| Valve Parts in Contact with Fluids |                              |                     |
|------------------------------------|------------------------------|---------------------|
| Body                               | Brass                        | 303 Stainless Steel |
| Seals and Discs                    | NBR or Cast UR, as Listed    |                     |
| Core Tube                          | 305 Stainless Steel          |                     |
| Core and Plugnut                   | 430F Stainless Steel         |                     |
| Core Springs                       | 302 Stainless Steel          |                     |
| Shading Coil                       | Copper                       | Silver              |
| Disc-Holder                        | CA                           |                     |
| Core Guide                         | CA (10.1 and 17.1 Watt only) |                     |

## Electrical

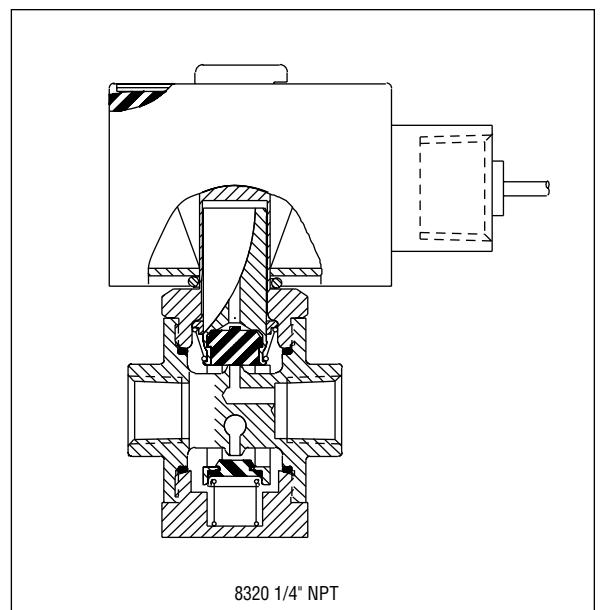
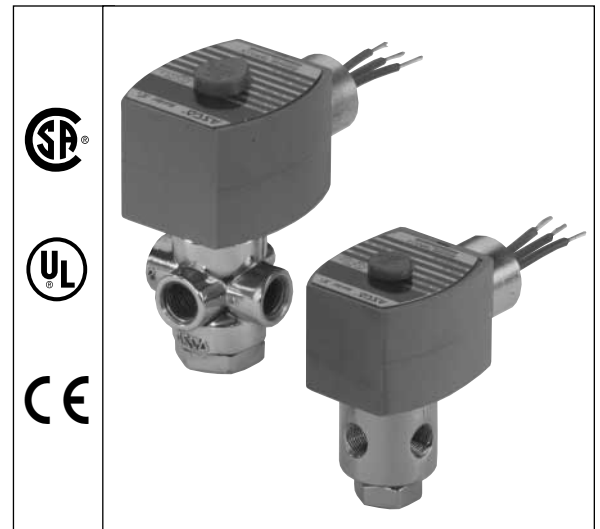
| Standard Coil and Class of Insulation | Watt Rating and Power Consumption |       |            |           | Spare Coil Part No. |        |                |        |
|---------------------------------------|-----------------------------------|-------|------------|-----------|---------------------|--------|----------------|--------|
|                                       | DC Watts                          | AC    |            |           | General Purpose     |        | Explosionproof |        |
|                                       |                                   | Watts | VA Holding | VA Inrush | AC                  | DC     | AC             | DC     |
| F                                     | 10.6                              | 6.1   | 16         | 30        | 238210              | 238310 | 238214         | 238314 |
| F                                     | -                                 | 9.1   | 25         | 40        | 238210              | -      | 238214         | -      |
| F                                     | 11.6                              | 10.1  | 25         | 50        | 238610              | 238710 | 238614         | 238714 |
| F                                     | -                                 | 17.1  | 40         | 70        | 238610              | -      | 238614         | -      |

**Standard Voltages:** 24, 120, 240, 480 volts AC, 60 Hz (or 110, 220, volts AC, 50 Hz). 6, 12, 24, 120, 240 volts DC. Must be specified when ordering. Other voltages are available when required.

## Solenoid Enclosures

**Standard:** Watertight, Types 1, 2, 3, 3S, 4, and 4X.

**Optional:** Explosionproof and Watertight, Types 3, 3S, 4, 4X, 6, 6P, 7, and 9. (To order, add prefix "EF" to the catalog number.)  
 See Optional Features Section for other available options.



## Nominal Ambient Temperature Ranges:

AC: 32°F to 125°F (0°C to 52°C)

DC: 32°F to 104°F (0°C to 40°C)

Refer to Engineering Section for details.

## Approvals:

CSA certified. UL listed General Purpose Valves.

Meets applicable CE directives.

Refer to Engineering Section for details.

## Specifications (English units)

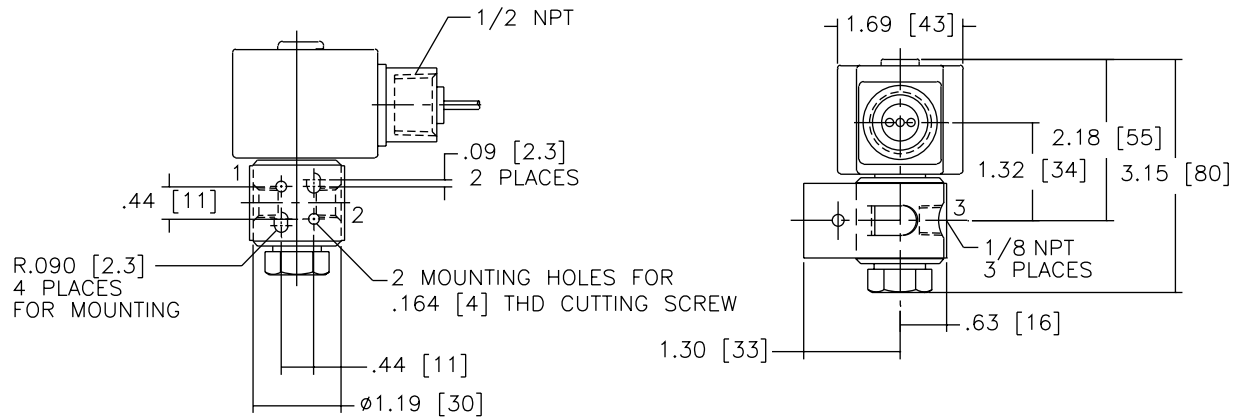
| Pipe Size<br>(ins.)                                                                                                                                                       | Orifice Size<br>(ins.) | Cv<br>Flow<br>Factor | Operating Pressure Differential (psi) |       |                         |                  |       |                         | Max.<br>Fluid<br>Temp. °F |     | Brass Body        |                     | Stainless Steel Body |                     | Watt Rating/<br>Class of Coil<br>Insulation ② |        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------|---------------------------------------|-------|-------------------------|------------------|-------|-------------------------|---------------------------|-----|-------------------|---------------------|----------------------|---------------------|-----------------------------------------------|--------|
|                                                                                                                                                                           |                        |                      | Max. AC                               |       |                         | Max. DC          |       |                         |                           |     |                   |                     |                      |                     |                                               |        |
|                                                                                                                                                                           |                        |                      | Air-Inert<br>Gas                      | Water | Lt. Oil<br>@ 300<br>SSU | Air-Inert<br>Gas | Water | Lt. Oil<br>@ 300<br>SSU | AC                        | DC  | Catalog<br>Number | Constr.<br>Ref. No. | Catalog<br>Number    | Constr.<br>Ref. No. | AC                                            | DC     |
| UNIVERSAL OPERATION (Pressure at any port)                                                                                                                                |                        |                      |                                       |       |                         |                  |       |                         |                           |     |                   |                     |                      |                     |                                               |        |
| 1/8                                                                                                                                                                       | 3/64                   | .06                  | 175                                   | 175   | 175                     | 125              | 125   | 125                     | 140                       | 120 | 8320G130 ①        | 1                   | 8320G140 ①           | 1                   | 9.1/F                                         | 10.6/F |
| 1/8                                                                                                                                                                       | 1/16                   | .09                  | 100                                   | 100   | 100                     | 65               | 65    | 65                      | 180                       | 120 | 8320G1            | 1                   | 8320G41              | 1                   | 9.1/F                                         | 10.6/F |
| 1/8                                                                                                                                                                       | 3/32                   | .12                  | 50                                    | 50    | 50                      | 50               | 50    | 50                      | 180                       | 120 | 8320G83           | 1                   | 8320G87              | 1                   | 6.1/F                                         | 10.6/F |
| 1/8                                                                                                                                                                       | 1/8                    | .21                  | 30                                    | 30    | 30                      | 20               | 20    | 20                      | 180                       | 120 | 8320G3            | 1                   | 8320G43              | 1                   | 9.1/F                                         | 10.6/F |
| 1/4                                                                                                                                                                       | 1/16                   | .09                  | 125                                   | 130   | 130                     | 75               | 75    | 75                      | 200                       | 150 | 8320G172          | 2                   | --                   | --                  | 10.1/F                                        | 11.6/F |
| 1/4                                                                                                                                                                       | 3/32                   | .12                  | 100                                   | 100   | 100                     | 60               | 60    | 60                      | 200                       | 150 | 8320G174          | 2                   | 8320G200             | 3                   | 17.1/F                                        | 11.6/F |
| 1/4                                                                                                                                                                       | 1/8                    | .25                  | 50                                    | 50    | 50                      | 25               | 25    | 25                      | 200                       | 150 | 8320G176          | 2                   | 8320G201             | 3                   | 17.1/F                                        | 11.6/F |
| 1/4                                                                                                                                                                       | 11/64                  | .35                  | 20                                    | 20    | 20                      | 12               | 12    | 12                      | 200                       | 150 | 8320G178          | 2                   | --                   | --                  | 10.1/F                                        | 11.6/F |
| NORMALLY CLOSED (Closed when de-energized)                                                                                                                                |                        |                      |                                       |       |                         |                  |       |                         |                           |     |                   |                     |                      |                     |                                               |        |
| 1/8                                                                                                                                                                       | 3/64                   | .06                  | 200                                   | 200   | 200                     | 200              | 200   | 200                     | 180                       | 120 | 8320G132          | 1                   | 8320G142             | 1                   | 6.1/F                                         | 10.6/F |
| 1/8                                                                                                                                                                       | 1/16                   | .09                  | 150                                   | 125   | 125                     | 125              | 125   | 125                     | 180                       | 120 | 8320G13           | 1                   | 8320G45              | 1                   | 6.1/F                                         | 10.6/F |
| 1/8                                                                                                                                                                       | 3/32                   | .12                  | 100                                   | 100   | 100                     | 100              | 100   | 100                     | 180                       | 120 | 8320G15           | 1                   | 8320G47              | 1                   | 6.1/F                                         | 10.6/F |
| 1/8                                                                                                                                                                       | 1/8                    | .21                  | 40                                    | 40    | 40                      | 40               | 40    | 40                      | 180                       | 120 | 8320G17           | 1                   | 8320G49              | 1                   | 6.1/F                                         | 10.6/F |
| 1/4                                                                                                                                                                       | 1/16                   | .09                  | 210                                   | 225   | 225                     | 160              | 160   | 160                     | 200                       | 150 | 8320G182          | 2                   | --                   | --                  | 17.1/F                                        | 11.6/F |
| 1/4                                                                                                                                                                       | 3/32                   | .12                  | 150                                   | 150   | 150                     | 115              | 115   | 115                     | 200                       | 150 | 8320G184          | 2                   | 8320G202             | 3                   | 10.1/F                                        | 11.6/F |
| 1/4                                                                                                                                                                       | 1/8                    | .25                  | 85                                    | 85    | 85                      | 60               | 60    | 60                      | 200                       | 150 | 8320G186          | 2                   | 8320G203             | 3                   | 10.1/F                                        | 11.6/F |
| 1/4                                                                                                                                                                       | 11/64                  | .35                  | 45                                    | 45    | 45                      | 25               | 25    | 25                      | 200                       | 150 | 8320G188          | 2                   | --                   | --                  | 10.1/F                                        | 11.6/F |
| NORMALLY OPEN (Open when de-energized)                                                                                                                                    |                        |                      |                                       |       |                         |                  |       |                         |                           |     |                   |                     |                      |                     |                                               |        |
| 1/8                                                                                                                                                                       | 3/64                   | .06                  | 200                                   | 200   | 200                     | 200              | 200   | 200                     | 180                       | 120 | 8320G136          | 1                   | 8320G146             | 1                   | 6.1/F                                         | 10.6/F |
| 1/8                                                                                                                                                                       | 1/16                   | .09                  | 150                                   | 125   | 125                     | 125              | 125   | 125                     | 180                       | 120 | 8320G27           | 1                   | 8320G51              | 1                   | 6.1/F                                         | 10.6/F |
| 1/8                                                                                                                                                                       | 3/32                   | .12                  | 100                                   | 100   | 100                     | 100              | 100   | 100                     | 180                       | 120 | 8320G29           | 1                   | 8320G53              | 1                   | 6.1/F                                         | 10.6/F |
| 1/8                                                                                                                                                                       | 1/8                    | .21                  | 40                                    | 40    | 40                      | 40               | 40    | 40                      | 180                       | 120 | 8320G31           | 1                   | 8320G55              | 1                   | 6.1/F                                         | 10.6/F |
| 1/4                                                                                                                                                                       | 1/16                   | .09                  | 250                                   | 250   | 250                     | 160              | 160   | 160                     | 200                       | 150 | 8320G192          | 2                   | --                   | --                  | 17.1/F                                        | 11.6/F |
| 1/4                                                                                                                                                                       | 3/32                   | .12                  | 150                                   | 140   | 140                     | 100              | 100   | 100                     | 200                       | 150 | 8320G194          | 2                   | 8320G204             | 3                   | 10.1/F                                        | 11.6/F |
| 1/4                                                                                                                                                                       | 1/8                    | .25                  | 70                                    | 70    | 70                      | 55               | 55    | 55                      | 200                       | 150 | 8320G196          | 2                   | 8320G205             | 3                   | 10.1/F                                        | 11.6/F |
| 1/4                                                                                                                                                                       | 11/64                  | .35                  | 40                                    | 40    | 40                      | 30               | 30    | 30                      | 200                       | 150 | 8320G198          | 2                   | --                   | --                  | 10.1/F                                        | 11.6/F |
| Notes: ① Supplied with cast UR disc.<br>② On 50 hertz service, the watt rating for the 6.1/F solenoid is 8.1 watts; the watt rating for the 9.1/F solenoid is 11.1 watts. |                        |                      |                                       |       |                         |                  |       |                         |                           |     |                   |                     |                      |                     |                                               |        |

## Specifications (Metric units)

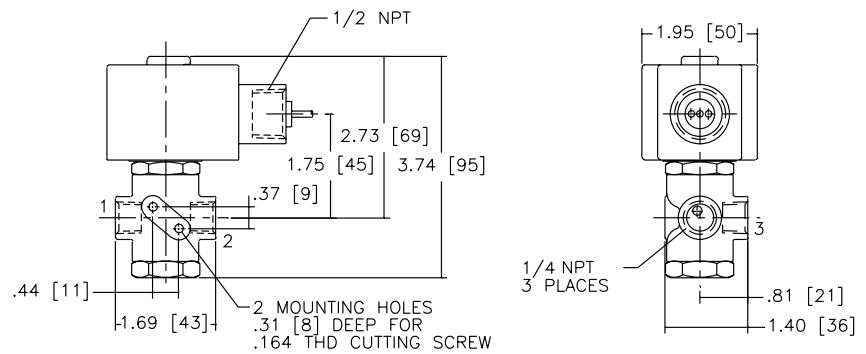
| Pipe Size (ins.)                                                                                                                                                          | Orifice Size (mm) | Kv Flow Factor (m3/h) | Operating Pressure Differential (bar) |       |                   |               |       |                   | Max. Fluid Temp. °C |      | Brass Body     |                  | Stainless Steel Body |                  | Watt Rating/ Class of Coil Insulation ② |        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------------|---------------------------------------|-------|-------------------|---------------|-------|-------------------|---------------------|------|----------------|------------------|----------------------|------------------|-----------------------------------------|--------|
|                                                                                                                                                                           |                   |                       | Max. AC                               |       |                   | Max. DC       |       |                   |                     |      |                |                  |                      |                  |                                         |        |
|                                                                                                                                                                           |                   |                       | Air-Inert Gas                         | Water | Lt. Oil @ 300 SSU | Air-Inert Gas | Water | Lt. Oil @ 300 SSU | AC                  | DC   | Catalog Number | Constr. Ref. No. | Catalog Number       | Constr. Ref. No. | AC                                      | DC     |
| UNIVERSAL OPERATION (Pressure at any port)                                                                                                                                |                   |                       |                                       |       |                   |               |       |                   |                     |      |                |                  |                      |                  |                                         |        |
| 1/8                                                                                                                                                                       | 1.2               | .05                   | 12                                    | 12    | 12                | 9             | 9     | 9                 | 59                  | 48.4 | 8320G130 ①     | 1                | 8320G140 ①           | 1                | 9.1/F                                   | 10.6/F |
| 1/8                                                                                                                                                                       | 1.6               | .08                   | 7                                     | 7     | 7                 | 4             | 4     | 4                 | 81                  | 48.4 | 8320G1         | 1                | 8320G41              | 1                | 9.1/F                                   | 10.6/F |
| 1/8                                                                                                                                                                       | 2.4               | .10                   | 3                                     | 3     | 3                 | 3             | 3     | 3                 | 81                  | 48.4 | 8320G83        | 1                | 8320G87              | 1                | 6.1/F                                   | 10.6/F |
| 1/8                                                                                                                                                                       | 3.2               | .18                   | 2                                     | 2     | 2                 | 1             | 1     | 1                 | 81                  | 48.4 | 8320G3         | 1                | 8320G43              | 1                | 9.1/F                                   | 10.6/F |
| 1/4                                                                                                                                                                       | 1.6               | .08                   | 9                                     | 9     | 9                 | 5             | 5     | 5                 | 92                  | 64.9 | 8320G172       | 2                | --                   | --               | 10.1/F                                  | 11.6/F |
| 1/4                                                                                                                                                                       | 2.4               | .10                   | 7                                     | 7     | 7                 | 4             | 4     | 4                 | 92                  | 64.9 | 8320G174       | 2                | 8320G200             | 3                | 17.1/F                                  | 11.6/F |
| 1/4                                                                                                                                                                       | 3.2               | .21                   | 3                                     | 3     | 3                 | 2             | 2     | 2                 | 92                  | 64.9 | 8320G176       | 2                | 8320G201             | 3                | 17.1/F                                  | 11.6/F |
| 1/4                                                                                                                                                                       | 4.4               | .30                   | 1                                     | 1     | 1                 | 1             | 1     | 1                 | 92                  | 64.9 | 8320G178       | 2                | --                   | --               | 10.1/F                                  | 11.6/F |
| NORMALLY CLOSED (Closed when de-energized)                                                                                                                                |                   |                       |                                       |       |                   |               |       |                   |                     |      |                |                  |                      |                  |                                         |        |
| 1/8                                                                                                                                                                       | 1.2               | .05                   | 14                                    | 14    | 14                | 14            | 14    | 14                | 81                  | 48.4 | 8320G132       | 1                | 8320G142             | 1                | 6.1/F                                   | 10.6/F |
| 1/8                                                                                                                                                                       | 1.6               | .08                   | 10                                    | 9     | 9                 | 9             | 9     | 9                 | 81                  | 48.4 | 8320G13        | 1                | 8320G45              | 1                | 6.1/F                                   | 10.6/F |
| 1/8                                                                                                                                                                       | 2.4               | .10                   | 7                                     | 7     | 7                 | 7             | 7     | 7                 | 81                  | 48.4 | 8320G15        | 1                | 8320G47              | 1                | 6.1/F                                   | 10.6/F |
| 1/8                                                                                                                                                                       | 3.2               | .18                   | 3                                     | 3     | 3                 | 3             | 3     | 3                 | 81                  | 48.4 | 8320G17        | 1                | 8320G49              | 1                | 6.1/F                                   | 10.6/F |
| 1/4                                                                                                                                                                       | 1.6               | .08                   | 14                                    | 16    | 16                | 11            | 11    | 11                | 92                  | 64.9 | 8320G182       | 2                | --                   | --               | 17.1/F                                  | 11.6/F |
| 1/4                                                                                                                                                                       | 2.4               | .10                   | 10                                    | 10    | 10                | 8             | 8     | 8                 | 92                  | 64.9 | 8320G184       | 2                | 8320G202             | 3                | 10.1/F                                  | 11.6/F |
| 1/4                                                                                                                                                                       | 3.2               | .21                   | 6                                     | 6     | 6                 | 4             | 4     | 4                 | 92                  | 64.9 | 8320G186       | 2                | 8320G203             | 3                | 10.1/F                                  | 11.6/F |
| 1/4                                                                                                                                                                       | 4.4               | .30                   | 3                                     | 3     | 3                 | 2             | 2     | 2                 | 92                  | 64.9 | 8320G188       | 2                | --                   | --               | 10.1/F                                  | 11.6/F |
| NORMALLY OPEN (Open when de-energized)                                                                                                                                    |                   |                       |                                       |       |                   |               |       |                   |                     |      |                |                  |                      |                  |                                         |        |
| 1/8                                                                                                                                                                       | 1.2               | .05                   | 14                                    | 14    | 14                | 14            | 14    | 14                | 81                  | 48   | 8320G136       | 1                | 8320G146             | 1                | 6.1/F                                   | 10.6/F |
| 1/8                                                                                                                                                                       | 1.6               | .08                   | 10                                    | 9     | 9                 | 9             | 9     | 9                 | 81                  | 48   | 8320G27        | 1                | 8320G51              | 1                | 6.1/F                                   | 10.6/F |
| 1/8                                                                                                                                                                       | 2.4               | .01                   | 7                                     | 7     | 7                 | 7             | 7     | 7                 | 81                  | 48   | 8320G29        | 1                | 8320G53              | 1                | 6.1/F                                   | 10.6/F |
| 1/8                                                                                                                                                                       | 3.2               | .18                   | 3                                     | 3     | 3                 | 3             | 3     | 3                 | 81                  | 48   | 8320G31        | 1                | 8320G55              | 1                | 6.1/F                                   | 10.6/F |
| 1/4                                                                                                                                                                       | 1.6               | .08                   | 17                                    | 17    | 17                | 11            | 11    | 11                | 92                  | 65   | 8320G192       | 2                | --                   | --               | 17.1/F                                  | 11.6/F |
| 1/4                                                                                                                                                                       | 2.4               | .10                   | 10                                    | 10    | 10                | 7             | 7     | 7                 | 92                  | 65   | 8320G194       | 2                | 8320G204             | 3                | 10.1/F                                  | 11.6/F |
| 1/4                                                                                                                                                                       | 3.2               | .21                   | 5                                     | 5     | 5                 | 4             | 4     | 4                 | 92                  | 65   | 8320G196       | 2                | 8320G205             | 3                | 10.1/F                                  | 11.6/F |
| 1/4                                                                                                                                                                       | 4.4               | .30                   | 3                                     | 3     | 3                 | 2             | 2     | 2                 | 92                  | 65   | 8320G198       | 2                | --                   | --               | 10.1/F                                  | 11.6/F |
| Notes: ① Supplied with cast UR disc.<br>② On 50 hertz service, the watt rating for the 6.1/F solenoid is 8.1 watts; the watt rating for the 9.1/F solenoid is 11.1 watts. |                   |                       |                                       |       |                   |               |       |                   |                     |      |                |                  |                      |                  |                                         |        |

Dimensions: inches (mm)

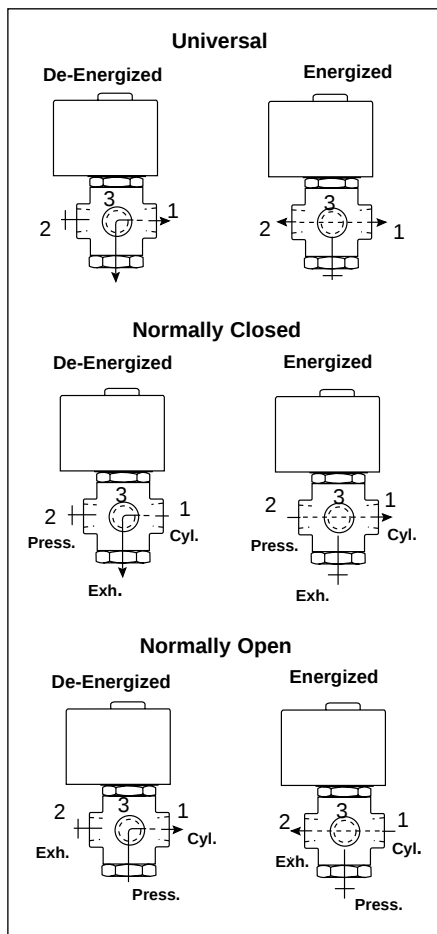
Constr. Ref. 1



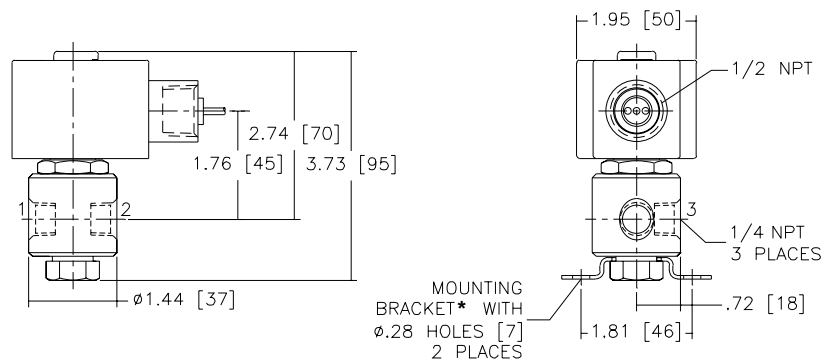
Constr. Ref. 2



FLOW DIAGRAMS



Constr. Ref. 3



\*MOUNTING BRACKET IS STANDARD ON THIS CONSTRUCTION

**NOTE:**  
**Bulletin 8320 is for General Purpose Solenoid Enclosure**  
**For Explosion Proof Solenoid Enclosure -**  
**See Form No. V5380**

# Installation & Maintenance Instructions

## GENERAL PURPOSE AND EXPLOSIONPROOF SOLENOIDS

**SERIES**

**8003**

**Form No.V5380R9**

**IMPORTANT:** See separate valve installation and maintenance instructions for information on: Operation, Positioning, Mounting, Cleaning, Preventive Maintenance, Causes of Improper Operation, Disassembly, and Reassembly of basic valve.

### DESCRIPTION

Catalog numbers 80031 and 80032 solenoids have a Type 1, General Purpose Solenoid Enclosure. Catalog numbers EF80031, EF80032, 80033, and 80034 solenoids have an explosionproof solenoid enclosure designed to meet Enclosure Type 3—Raintight, Type 7 (C & D) Explosionproof Class I, Division 1, Groups C & D and Type 9 (E, F, & G) — Dust Ignitionproof Class II, Division 1, Groups E, F, & G, and have a temperature range code of TC3. Series 8003 solenoids (when installed as a solenoid and not as part of an ASCO valve), are supplied with a core which has a 0.250–28 UNF–2B tapped hole with 0.38 or 0.63 minimum full thread.

### OPERATION

When the solenoid is energized, the core is drawn into the solenoid base sub—assembly.

**IMPORTANT:** When the solenoid is de—energized, the initial return force for the core, whether developed by spring, pressure, or weight must exert a minimum force to overcome residual magnetism created by the solenoid. Minimum return force for AC construction is 1 lb, 5 oz, and 5 oz, for DC construction.

### INSTALLATION

Check nameplate for correct catalog no., voltage, frequency, wattage, and service.

Enclosure Types 3, 4, 7, and 9

**▲ CAUTION:** To prevent fire or explosion, do not install solenoid enclosure where ignition temperature of hazardous atmosphere is less than 160° C. On valves used for steam service or when a class “H” solenoid is used, do not install in hazardous atmosphere where ignition temperature is less than 180° C. See nameplate for service. Open circuit before disassembling. Reassemble before operating.

When used in –40° C Ambient Temperature Applications

**▲ WARNING:** To prevent fire or explosion, use only conduit runs ½” in size with a sealing fitting connected within 5 feet of the solenoid enclosure.

**IMPORTANT:** To protect a solenoid operator or valve, install a strainer or filter, suitable for the service involved in the inlet side as close to the valve or operator as possible. Clean periodically depending on service conditions. See ASCO Series 8600, 8601 and 8602 for strainers.

#### Positioning

This solenoid is designed to perform properly when mounted in any position. However, for optimum life and performance, the solenoid should be mounted vertically and upright to reduce the possibility of foreign matter accumulating in the solenoid base sub—assembly area.

#### Wiring

Wiring must comply with local codes and the National Electrical Code. The general purpose solenoid housing has a 7/8” diameter hole to accommodate 1/2” conduit. To facilitate wiring, the general purpose solenoid enclosure may be rotated 360° by removing the retaining cap or clip.

**▲ CAUTION:** When metal retaining clip disengages, it will spring upward.

Rotate solenoid enclosure to desired position. Then replace retaining cap or clip before operating. On some solenoids, a grounding wire which is green or green with yellow stripes is provided. Use rigid metallic conduit to ground all enclosures not provided with a green grounding wire. For the explosionproof solenoid enclosure, electrical fittings must be approved for use in hazardous locations. The explosionproof solenoid enclosure has a 1/2” conduit connection and may be rotated 360° to facilitate wiring.

**▲ WARNING:** To prevent the possibility of death, serious injury or property damage, from accidental disengagement of solenoid from valve body, hold housing securely by wrenching flats while removing or replacing housing cover.

To rotate enclosure, loosen housing cover using a 1” socket wrench. Two wrenching flats are provided on the housing to hold it securely in place while the cover is being loosened or tightened. Rotate housing to desired position and replace cover before operating. Torque housing cover to 135 ± 15 in—lbs [15,3 ± 1,7 Nm].

**NOTE:** Alternating current (AC) and direct current (DC) solenoids are built differently. To convert from one to the other, it is necessary to change the complete solenoid including the core and solenoid base sub—assembly, not just the coil. Consult ASCO.

#### Solenoid Enclosure Assembly

Catalog 80031 and 80032 solenoids may be assembled as a complete unit. Tightening is accomplished by means of a hex flange at the base of the solenoid enclosure.

Catalog EF80031, EF80032, 80033, and 80034 solenoids may be assembled as a complete unit. Tightening is accomplished by means of two milled slots (wrenching flats) above the threaded area of the solenoid base sub—assembly. Use special ASCO wrench supplied (order No. K168146–1). An alternate type wrench adapter is also available which tightens the assembly by means of four (4) pin holes in the solenoid base sub—assembly. If this alternate wrench is used the solenoid must be completely disassembled, see *Coil Replacement* section.

#### Solenoid Temperature

Standard solenoids are supplied with coils designed for continuous duty service. When the solenoid is energized for a long period, the solenoid enclosure becomes hot and can be touched by hand only for an instant. This is a safe operating temperature. Any excessive heating will be indicated by the smoke and odor of burning coil insulation.

### MAINTENANCE

**▲ WARNING:** To prevent the possibility of death, serious injury or property damage, turn off electrical power, depressurize solenoid operator or valve, and vent fluid to a safe area before servicing.

#### Cleaning

All solenoid operators and valves should be cleaned periodically. The time between cleaning will vary depending on medium and service conditions. In general, if the voltage to the coil is correct, sluggish valve operation, excessive noise, or leakage will indicate that cleaning is required. Clean strainer or filter when cleaning the valve.

#### Preventive Maintenance

- Keep the medium flowing through the solenoid operator or valve as free from dirt and foreign material as possible.
- While in service, the solenoid operator or valve should be operated at least once a month to ensure proper opening and closing.
- Depending on the medium and service conditions, periodic inspection of internal valve parts for damage or excessive wear is recommended. Thoroughly clean all parts. Replace any parts that are worn or damaged.

## Causes of Improper Operation

- **Faulty Control Circuit:** Check the electrical system by energizing the solenoid. A metallic *click* indicates loss of power supply. Check for loose or blown fuses, open—circuited or grounded coil, broken lead wires or splice connections.
- **Burned—Out Coil:** Check for open—circuited coil. Replace if necessary. Check supply voltage; it must be the same as specified on nameplate and as marked on the coil.
- **Low Voltage:** Check voltage across the coil leads. Voltage must be at least 85% of nameplate rating.

## Coil Replacement

### Solenoid Catalog Numbers 80031 and 80032

#### General Purpose Enclosure (Refer to Figure 1 below)

1. Disconnect coil lead wires and grounding wire if present.
2. Remove retaining cap or clip, nameplate (if present), and housing or housing with nameplate (alternate construction).

**CAUTION:** When metal retaining clip disengages, it will spring upward.

3. Slip spring washer, insulating washer, and coil off the solenoid base sub—assembly. Insulating washers are omitted when a molded coil is used.
4. Coil is now accessible for replacement
5. Torque housing cover to  $135 \pm 15$  in—lbs [ $15,3 \pm 1,7$  Nm].

### Catalog Numbers EF80031, EF80032, 80033 and 80034

#### Explosionproof Solenoid Enclosure

NOTE: This solenoid has two constructions, refer to Figure 2 on page 3 for the first construction and Figure 3 on page 4 for the alternate construction.

1. Disconnect coil lead wires and grounding wire if present.

**WARNING:** To prevent the possibility of death, serious injury or property damage from accidental disengagement of solenoid from valve body, hold housing securely by wrenching flats while removing or replacing housing cover.

2. Unscrew housing cover using 1" socket wrench. Two wrenching flats are provided to hold the housing securely in place while the cover is being removed or replaced.
3. Remove take—up spring, flux washer, insulating washer, coil and insulating washer. For the alternate construction, slide retaining cup sideways to disengage it from the top of the solenoid base sub—assembly. Then remove yoke, spring washer, insulating washer, coil and insulating washer. Insulating washers are omitted when a molded coil is used.
4. Reassemble solenoid according to exploded view. Before reassembly, refer to NOTE following for cleaning and greasing requirements.
5. Torque housing cover to  $135 \pm 15$  in—lbs [ $15,3 \pm 1,7$  Nm].

**CAUTION:** Solenoid must be fully reassembled because the housing and internal parts complete the magnetic circuit. Be sure to replace an insulating washer at each end of non—molded coil.

NOTE: Solenoid Catalog Nos. EF80031, EF80032, 80033, and 80034, —Installation and maintenance of explosionproof equipment requires more than ordinary care to ensure safe performance. All finished surfaces of the solenoid are constructed to provide flame—proof seal. Be sure that the surfaces are wiped clean before reassembling. Grease the explosionproof solenoid enclosure with DOW CORNING® 111 Compound lubricant or an equivalent high—grade silicone grease. Grease all joints thoroughly including the underside of the solenoid base sub—assembly flange and internal threads of the housing cover.

| Part Name                  | Torque Value in Inch—Pounds | Torque Value in Newton—Meters |
|----------------------------|-----------------------------|-------------------------------|
| Solenoid Base Sub—Assembly | $175 \pm 25$                | $19,8 \pm 2,8$                |

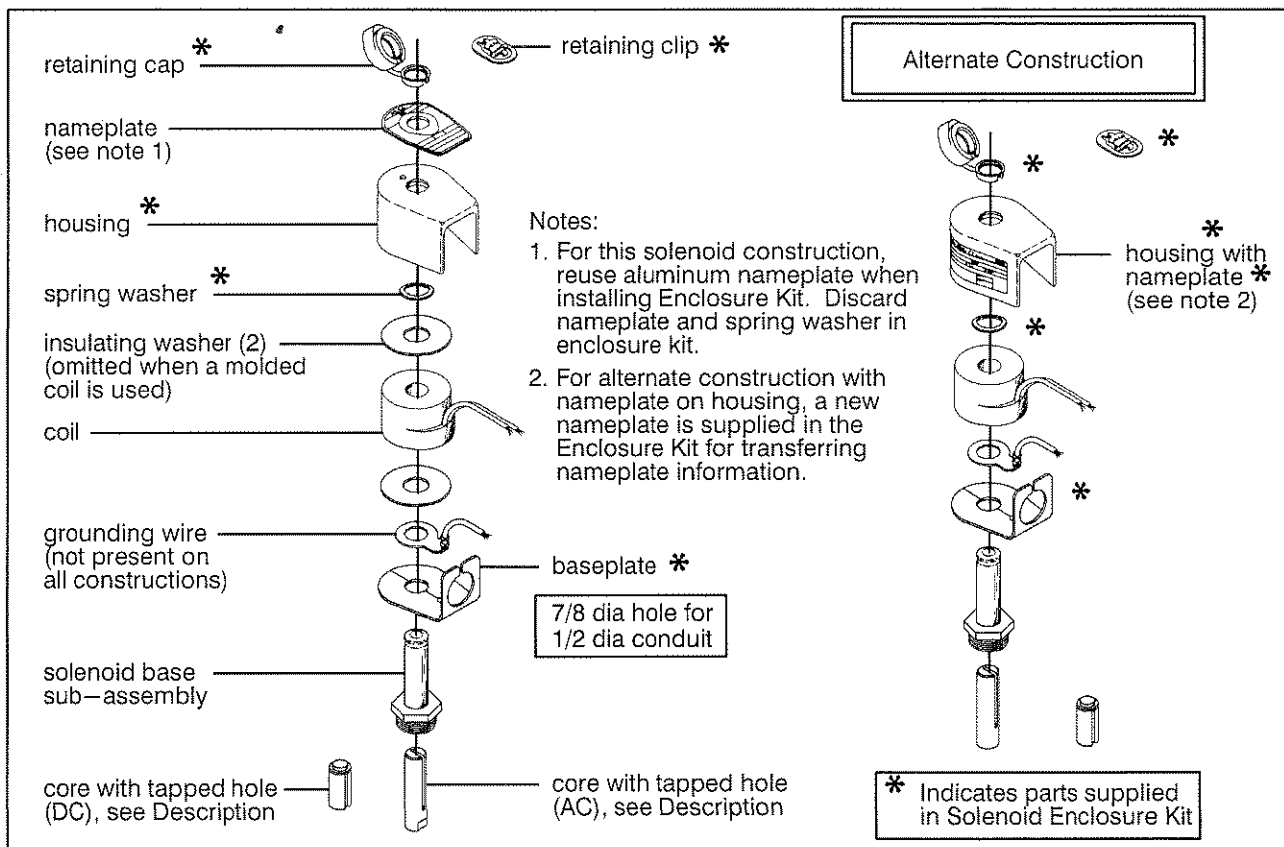


Figure 1, Catalog Nos. 80031 and 80032 General Purpose Solenoid Enclosure.

## Torque Chart

| Part Name                  | Torque Value in Inch—Pounds | Torque Value in Newton—Meters |
|----------------------------|-----------------------------|-------------------------------|
| Solenoid Base Sub—Assembly | 175 ± 25                    | 19,8 ± 2,8                    |
| Housing Cover              | 135 ± 15                    | 15,3 ± 1,7                    |

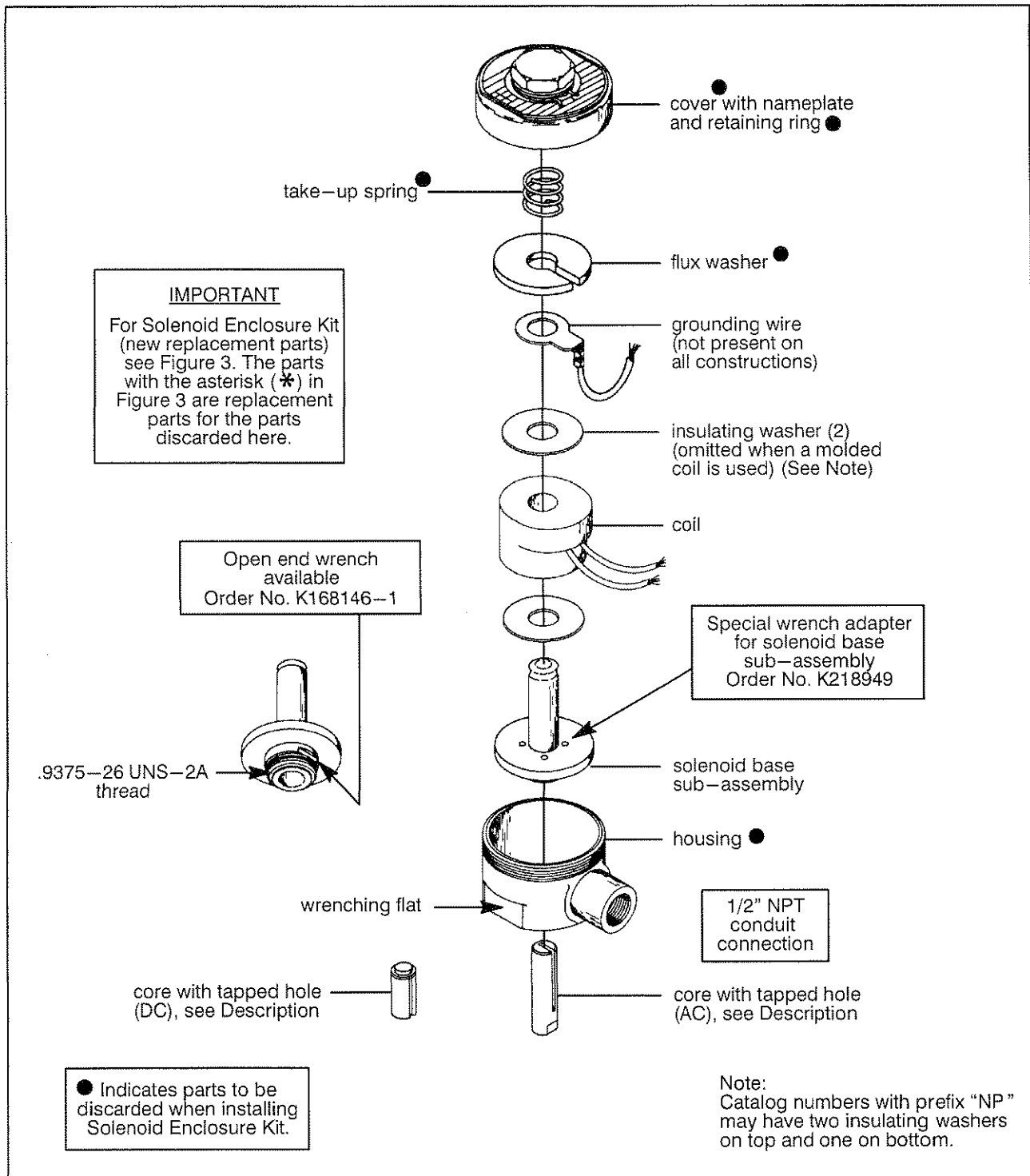


Figure 2. Catalog Nos. EF80031, EF80032 80033 and 80034 Explosionproof Solenoid Enclosure.

## Torque Chart

| Part Name                  | Torque Value in Inch—Pounds | Torque Value in Newton—Meters |
|----------------------------|-----------------------------|-------------------------------|
| Solenoid Base Sub—Assembly | 175 ± 25                    | 19,8 ± 2,8                    |
| Housing Cover              | 135 ± 15                    | 15,3 ± 1,7                    |

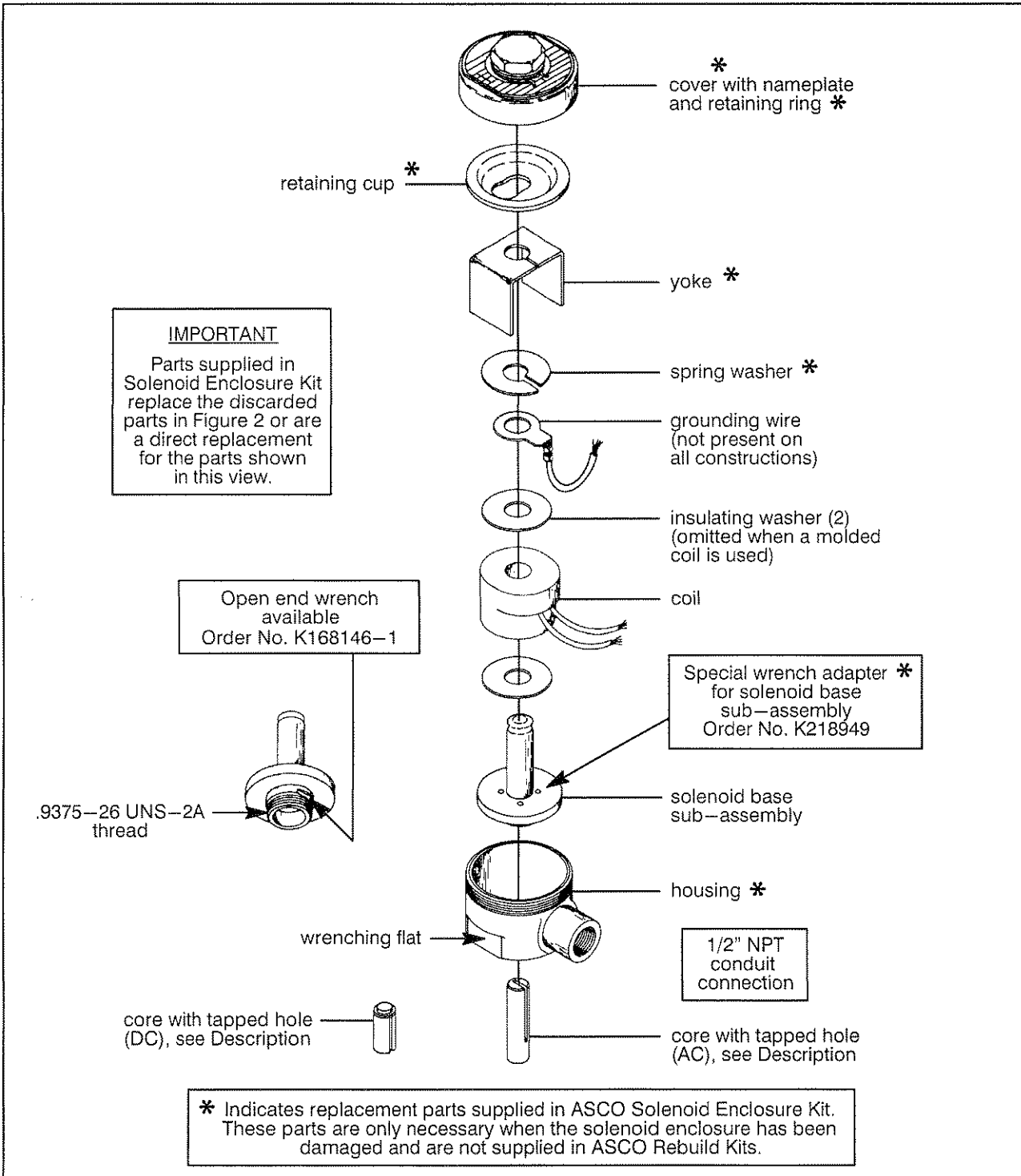


Figure 3. Catalog Nos. EF80031, EF80032, 80033 and 80034 Alternate Construction  
Explosionproof Solenoid Enclosure.

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