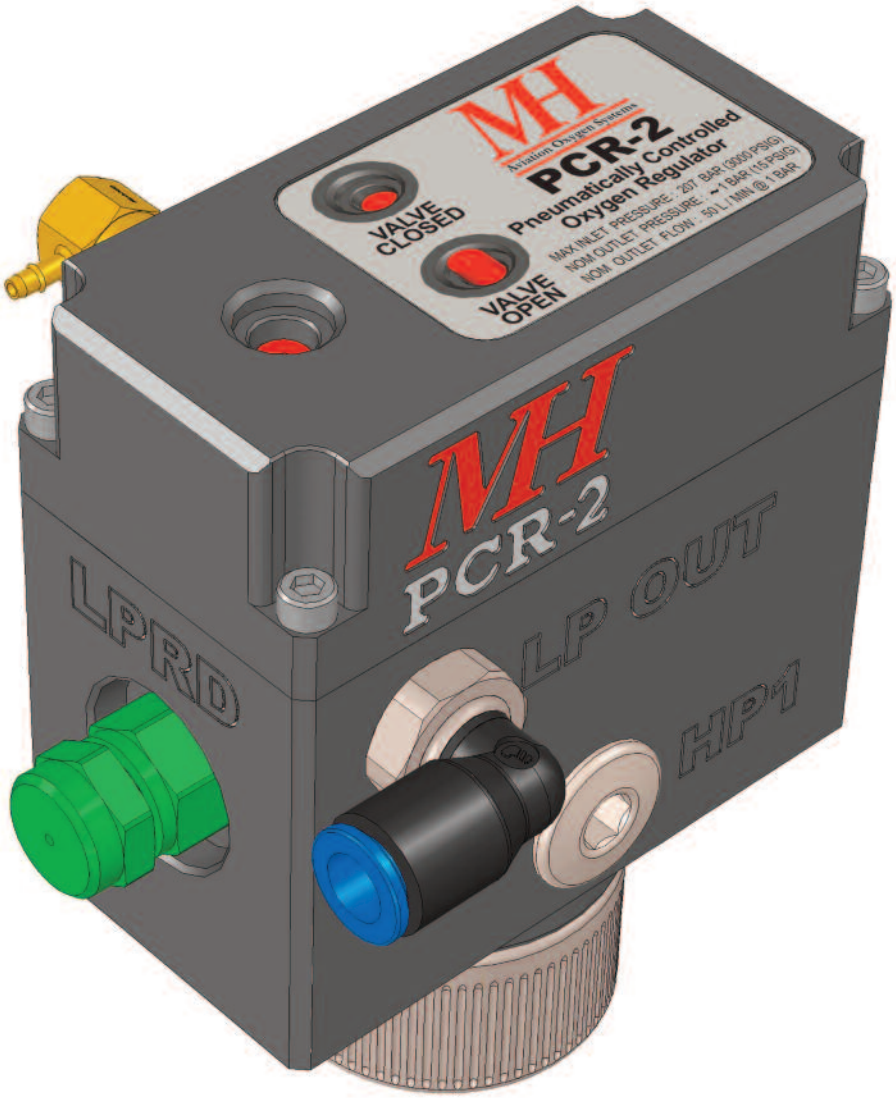
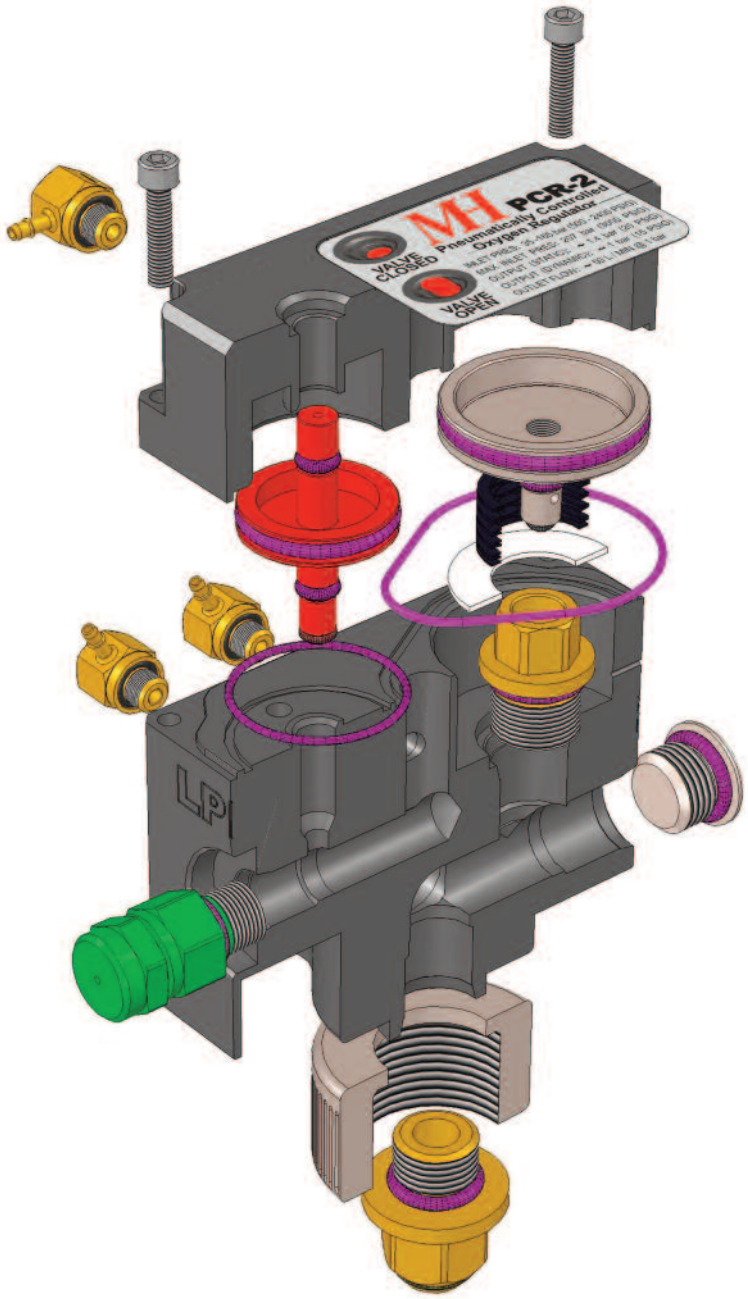
PCR-2 Pneumatically Controlled Remote Oxygen Regulator

Reference Manual



PCR-2 Pneumatically Controlled Remote Oxygen Regulator

Conveniently connects directly to your cylinder by hand



Audience & Purpose of this Manual

This manual is intended to allow one to become familiar with the purpose, operating aspects & application potential of the PCR-2 adaptive remote controlled oxygen regulator system.

General Description

The PCR-2 system is a completely integrated, pneumatic powered and remotley operated oxygen regulator, designed to provide you with unmatched remote control, safety, comfort, and convenience at an affordable price.

Useage
The PCR-2 can be used with any off-the-shelf industry standard CGA-540 cylinder valve (optionally DIN-477-9), providing the ability to remove the PCR-2 from the cylinder for easy refillingor exchanging purposes with industry standard CGA-540 adapters. If removing the cylinder is not convenient, an SAE-4 high pressure access port is provided on the back of the PCR-2 to allow for an optional remote fill port and/or a remote pressure gauge. This SAE-4 port provides you with a variety of options for your installation application needs. (see pages xx and on for diagrams of installation suggestions).

Main inlet service port
The PCR-2 is designed to be conveniently attached to the screw threads, by hand, of the service port of an industry standard CGA-540 oxygen cylinder. Optionally, the PCR-2 can be ordered with a DIN-477-9 screw-on fitting for use with most European oxygen cylinders.

The PCR-2 is not intended to be used as the main high pressure shut off, rather for providing the ability to remotely turn on & off the main regulated low pressure oxygen supply to your delivery system.

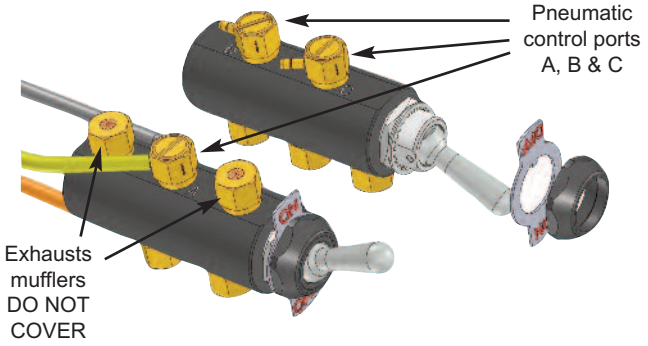
The valve of the cylinder should be turned off during times of aircraft storage as to mitigate any oxygen system drainage. It is not necessary to close the cylinder valve during refueling, lunch stops, leg stretches or for other brief periods..

Auxiliary HP Inlet ports
In addition to the main screw-on port there are three additional SAE-4 HP ports for auxiliary (optional) utility applications. These ports can be used for a remote filler station, gauge and for cascading to additional cylinders. These auxiliary SAE14 HP ports come standard with plugs installed. A number of HP AN and Swageloc® style fittings are comparable with these ports. The main 'screw-on' inlet port is internally pneumatically connected to these auxiliary SAE-4 ports.

Main Service L.P. Outlet Port
The main low pressure regulated outlet has one O-ring face seal style port (G 1/8 BSPP). This comes standard with a swivel elbow push-in style QD fitting compatible with 6mm OD polyurethane tubing.

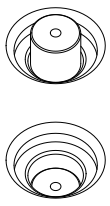
LPRD Port
For long-term connected and pressurised applications, this SAE-2 port accommodates an optional Low Pressure Relief Device. It reliefs, vents, oxygen to mitigate possible damage to the system in the event the main regulator creates an over-pressure of about 65~75 psig. This LPRD can be applied to an optional over-board relieving system if the installation requires such.

Pneumatic control ports A, B & C
There are three 10-32 threaded ports where the remote control toggle switch pneumatically connects via o-ring face seal banjo type fittings. These ports are labeled A, B & C. and have a matching set of labeled ports on the pneumatic toggle control switch.

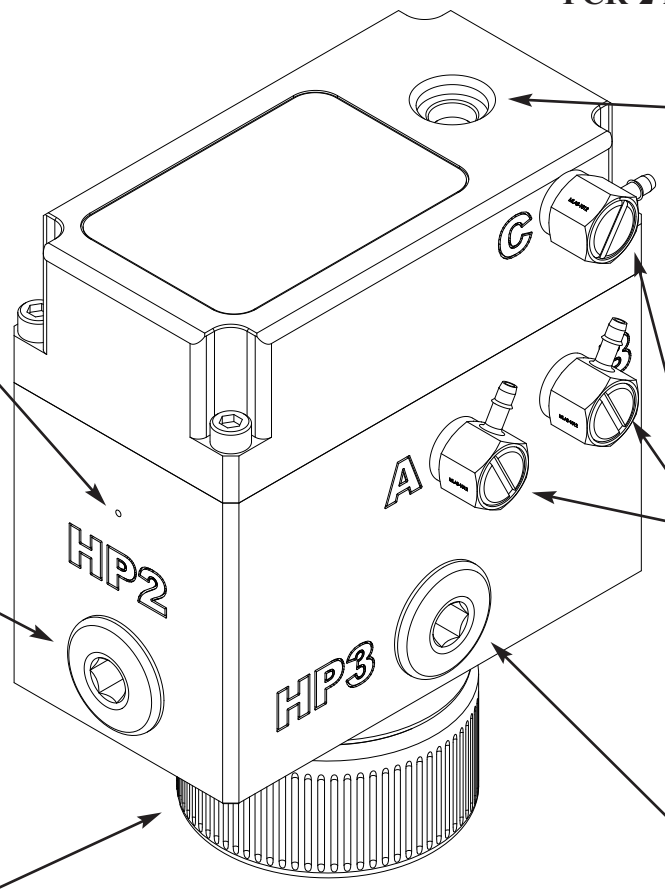


There are three small 1/8" O.D. Color coded kink resistant 1/8” dia. polyurethane pneumatic lines that connect the remote ON/OFF toggle pneumatic switch/valve to the PCR-2. The pressure through these lines is the same low pressure that is supplied to the outlet and is flow restricted to a mere 1/64 liter-per-minute. This helps to prevent against the low pressure oxygen supply contributing to any fires in the event these lines should become severed.

Pop-up valve indicator
There is a small red pop-up button on the top of the PCR-2 that can be observed popping-up or down as the valve is pneumatically opened or shut off. While the button is down, the low pressure outlet port is shut off.



PCR-2 ledged



Static vent port hole

DO NOT COVER OR BLOCK

Two of three (3) HP utility SAE-4 ports for optional configurations

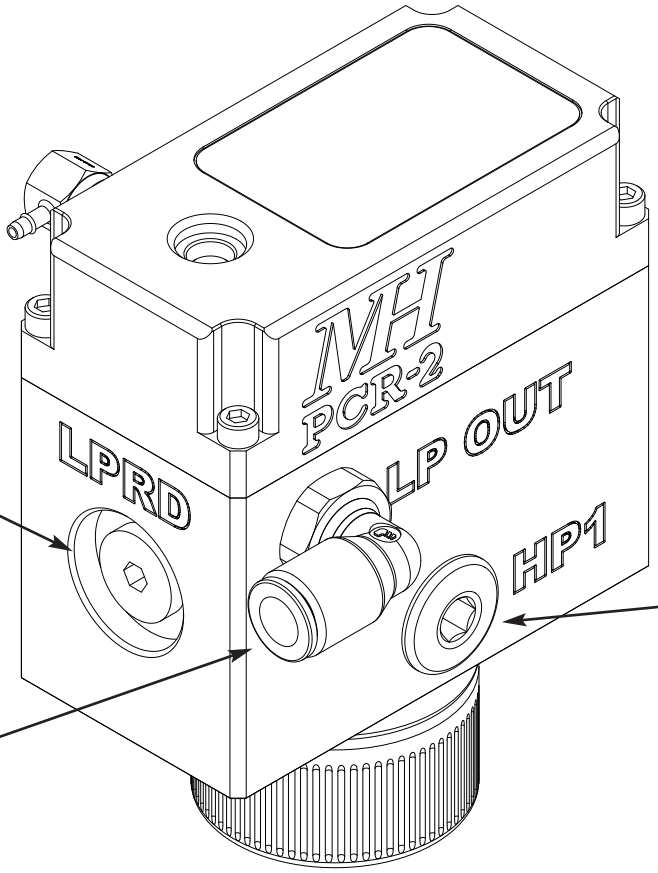
Main 'Screw-On' inlet port.
CGA-540 (USA)
or
DIN-477-9 (Euro)

Pop-Up indicator for Pneumatic ON/Off valve
up = on
down = off

Pnuematic control ports A, B & C

Pneumatic port fittings to Remote control switch for desmodromically (push-pull) actions for extreme-temperature operations

Three of three (3) HP utility SAE-4 ports for optional configurations



SAE-2 port for optional Low-Pressure-Relief-Device port for over-board relief in near air-tight or contained small volume installations

One of three (3) HP utility SAE-4 ports for optional configurations

BSPP Low Pressure oxygen outlet service port with 6 mm. Swivel Elbow for easy hook-up of 6mm OD polyurethane tubing

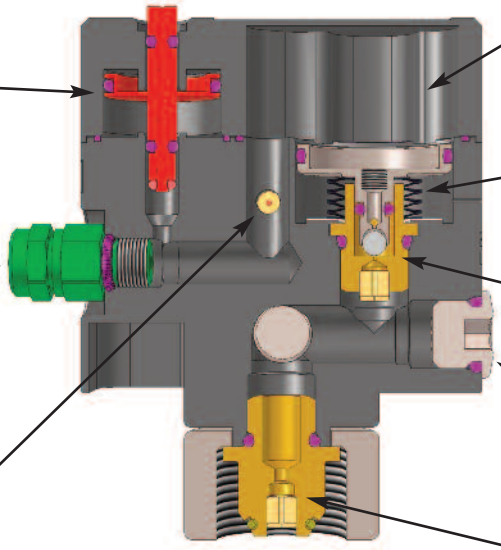
Performance Features

Desmodromically remotle operating on/off outlet 'pop-up' valve for operating in extended temperature ranges -40 through +60 °C

Optional Low-Pressure-Relief-Device connects to this SAE-2 port for over-pressure situations that may occurre in long-term connected and pressurized applications.

An optional over-board system can be fitted for near air-tight or contained small volume installations.

SPrecision Saphire embedded brass orifices control the rate and flow of oxygen in the lengths of the remotle controlled switch



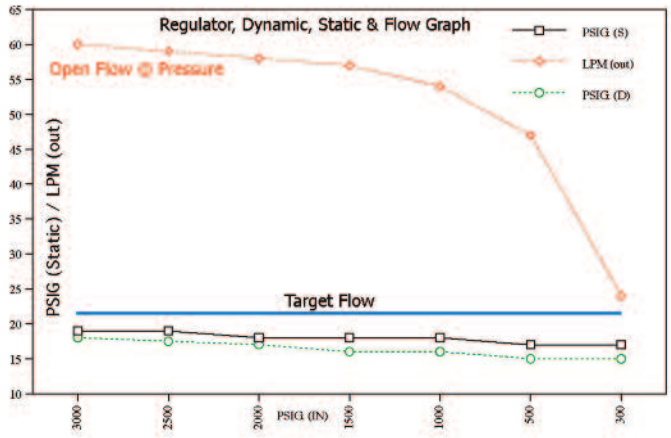
Regulator outlet plenum for improved output flow transient stability wile using constatnt flow and EDS pulse demand regulators together

precision formed wave spring provides a stable and repeatable regulator reference without transient resonance.

Precision PTFE Ball & brass inlet seat with serviceable dual-mesh screen type inlet filter for long-life operations

SAE-4 HP utility ports for optional supply, fill and gaige configurations

Main inlet fittings all have an o-ring seal for simple hand-tight connections. Unlike sintered brass we use dual-mesh stainless screen filters that are serviceable for long-life operations



Our regulator designs have a virtually flat outlet pressure regulation curve for both lock-up (static) and flowing (dynamic) with inlet pressures from 300 to 3,000 psig. In open and closed-loop instantaneous flow tests, they have very well dampened, oscillation free flows. Flows of 55 to 60 liters/minute are measured through a controlled pneumatic resistance with inlet pressures of 1,000 to 3,000 psig. Target flows are 22 ±2 liters/minute throughout the inlet pressure range of 500 to 3,000 psig. EDS units only need to have the regulator that instantaneously delivers ~10 liters/minute to complement the needed amount of oxygen for pressure altitudes up to 18,000 ft.

Regulator Features Include:
Very constant lock-up and flowing pressure range and large flow reserve throughout the pressure life of the cylinder. Light weight aluminum body with oxygen compatible brass and seat materials in the critical wetted regulating/throttling high-pressure areas. Wide operating temperature range. -20 to +50 C°. Special flat-wire double-helix spring design complements the gas dynamics and aging characteristics of the inlet seat to provide lock-up to dynamic pressures that are unusually tightly matched for a piston type regulator designs throughout it's service life. Our unique ball-and-flat-seat design provides very fast response times to lock-up with an oscillationfree high flow factor specifically designed for use with pulse demand systems.

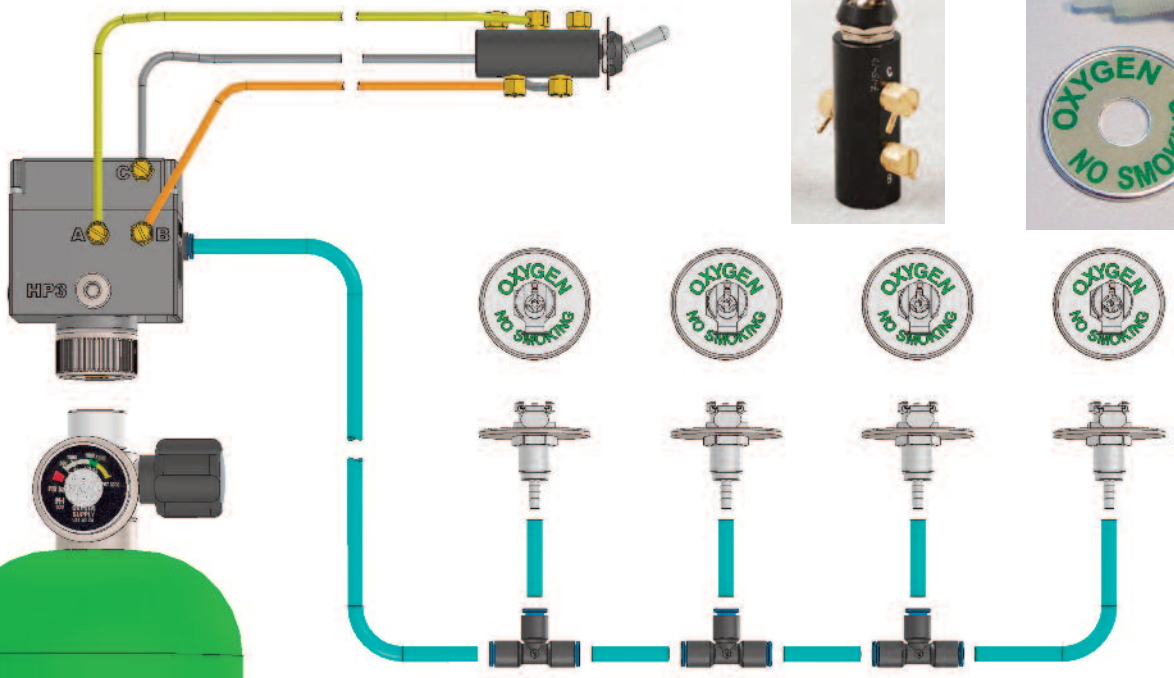
Testing & Verification:
All of our regulators are 100% tested during assembly for multiple parameters before they are packaged and made ready for sale. Dynamic flow testing is performed with the regulator feeding through a mass-flow meter at the end of 20 feet of 6mm O.D. 4mm ID tubing to guarantee that the regulator will operate up to four EDS units at 18,000 ft. with cylinder pressures as low as 500 psig. The typical length of tubing used in most built-in applications is about 20 feet.

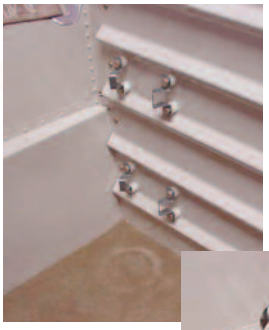
Why a piston type regulator, why not a diaphragm type as seen in medical equipment? Piston-type compressed gas regulators are well known for being low-cost, rugged, light-weight and able to be serviced with standard assembly practices. Additionally. they have the ability to ingest small particles at extreme temperatures while performing well within specifications called out for their duty. Their simplicity provides the means to a quick diagnostic and repair even in the field. Diaphragm regulators are known more for their precision and high-cost but, are sensitive to harsh environments making them more suited for stationary and controlled i door applications. Because they usually do not have suitable lock-up to flow pressure characteristics, are larger and heaver, they are usually unsuitable for pulse-demand systems.

Basic Applications

With our high and low pressure pneumatic accessories, there are virtuality hundreds of ways to configure your PCR installation application. This sections will show a few of some of the most popular applications our customers have been configuring.

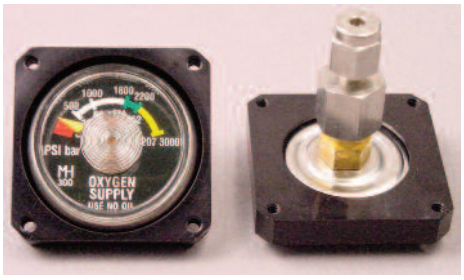
First is the most basic application using the oxygen outlet kits with self sealing CPC style fittings. We have a number of cylinder hold-down kits for aluminum and composite-fiber-wound cylinders.

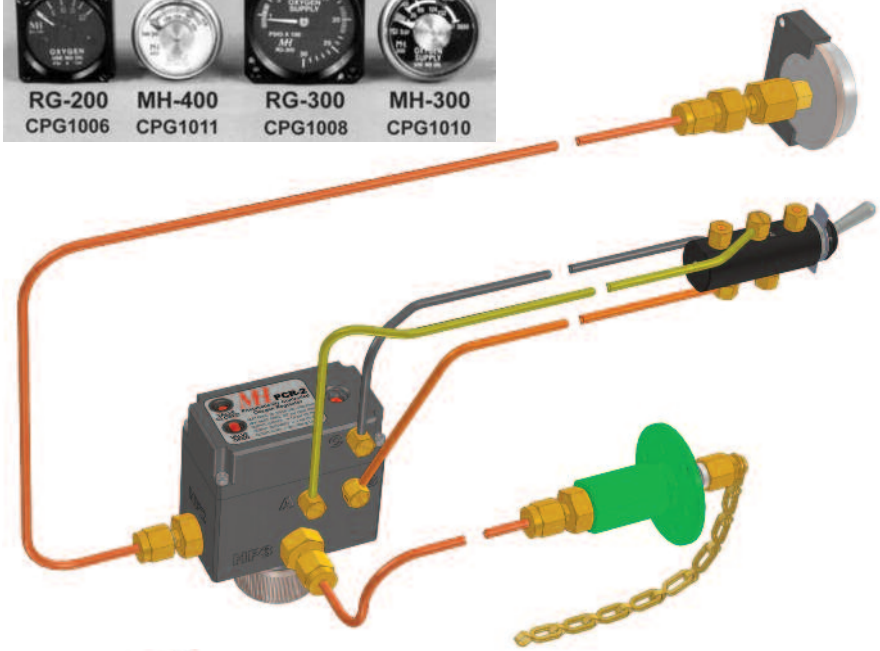


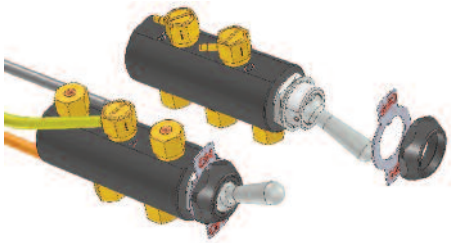


Easy & secure cylinder mounting methods

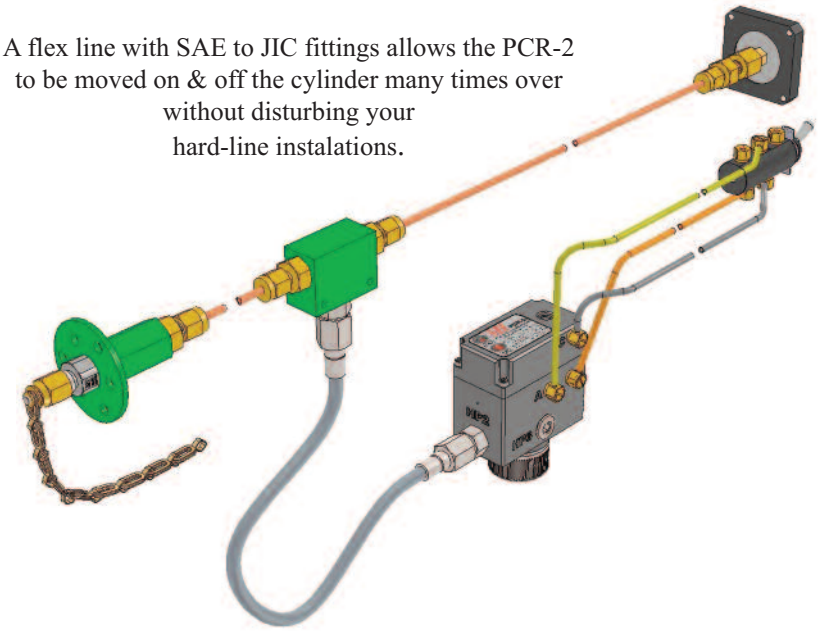
Basic Applications



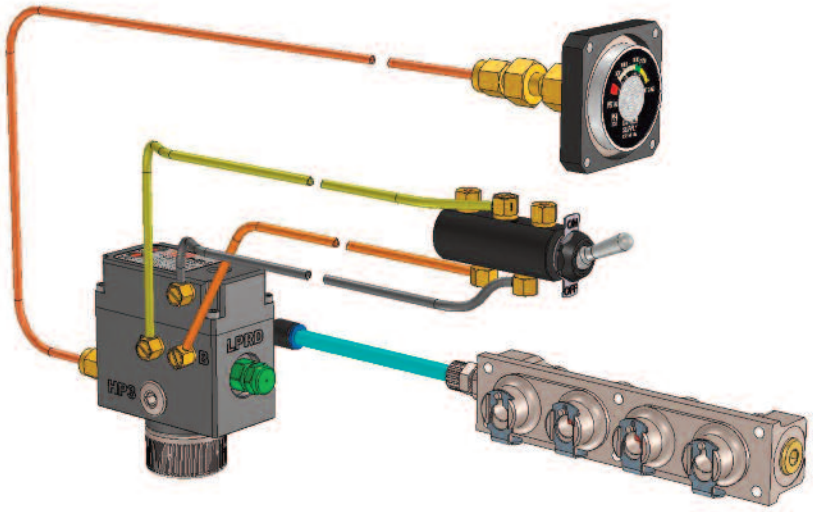


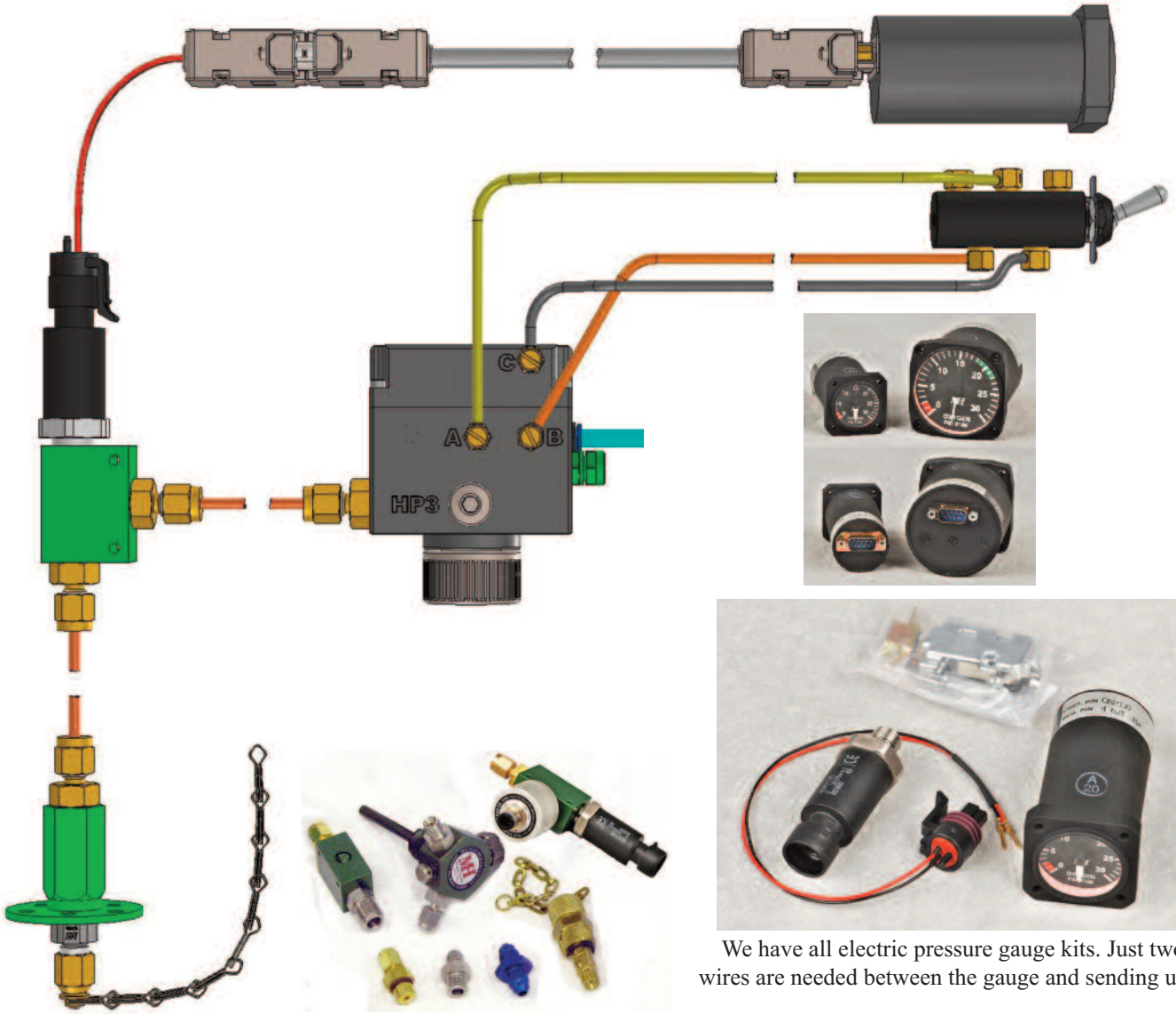


A flex line with SAE to JIC fittings allows the PCR-2 to be moved on & off the cylinder many times over without disturbing your hard-line instalations.



There are many fitting and accessory options that allow you to apply the PCR-2 to accomodate many of your instalation needs.

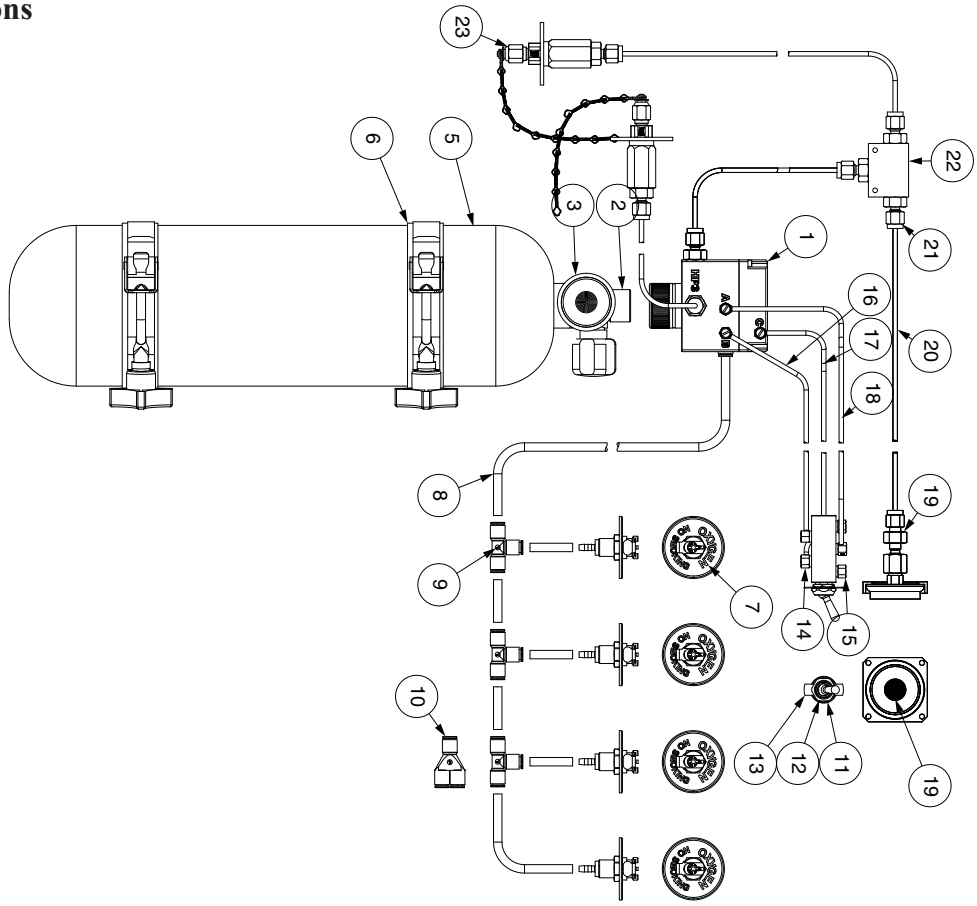




We have all electric pressure gauge kits. Just two wires are needed between the gauge and sending unit.

Showing yet a more semi-permanent installation application with our new 4x bulkhead mountable CPC type outlet manifold, a remote filler station where the cylinder can easily be removed for filling, inspections and servicing.

Basic Applications



REF	QTY	Part Number	Rev	Description
1	1	APCR2-0100-00	A0	PCR-2 Body Assembly
2	1	00CYL-0014-00		Cylinder Valve, Vertical Output, CGA-540-S x 3/4-16 SAE-8M
3	3	00CPG-1010-00		Pressure Gauge, Raw, MH-300
4	1			Burst Plug
5	1	00CYL-1038-00		CFF-480 Cylinder
6	2	00CMK-0022-02		Ø4.75 Cylinder Mounting Kit, QR
7	8	00CPC-0018-01		CPC Bulkhead Outlet with CV, Plastic, Kit
8	7	19600-0003-00		PolyUrethane Tubing, 6mm OD, Blue
9	3	00HDW-1328-00		One-Touch Fitting, 6x6x6mm T-Union
10	1	00HDW-1336-00		One-Touch Fitting, 6x6x6mm Y-Union
11	2	19026-0005-00		Switch, Pneumatic, 4-way
12	2	19027-0006-00		Dress Nut, Black Anodized, 15/32-32 THD
13	2	50001-0003-00		Switch Plate, "On/Off"
14	3	19055-0002-00		Banjo Fitting, Adjustable, 90° elbow, #10-32 x Barb, 1/16 I...
15	2	09025-0023-00		Breather, #10-32
16	1	19600-0006-00		PolyUrethane Tubing, 1/8" OD, Orange
17	1	19600-0007-00		PolyUrethane Tubing, 1/8" OD, Gray
18	1	19600-0005-00		PolyUrethane Tubing, 1/8" OD, Yellow
19	6	00CPG-0030-00		MH-300 Gauge Kit w/ Bezel
20	6	19605-0002-00		Copper Tubing, 1/8" OD
21	7	00HDW-0108-00		SAE-4M x 1/8 OD Tube Compression, Brass
22	1	00MAN-0012-00	A	Tee, SAE 4 x 4 x 4
23	2	00BLT-1022-xx	F0	Assembly, Bulkhead Refill, AN-800 Version Matrix

5I930-0010-00

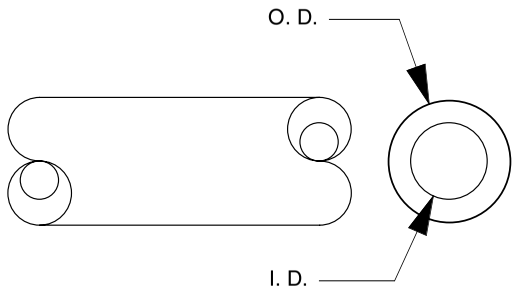
REVISION HISTORY			
REV	DA-MO-YR	E. C. O. / APPR.	NOTES
A	20-06-00	PLM	UPGRADED DRAWING ONLY WITH NEW FORMAT
B	21-04-13	PLM	UPGRADED WITH IMAGES

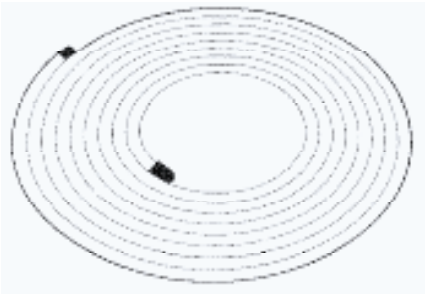
SPECIFICATIONS for Item # 19605-0002-00 (1/8" OD Copper Tubing)

MATERIAL:	99.9% COPPER, 0.02% PHOSPHORS UNS C12200, ASTM-B68
PRESSURE RATING:	3500 PSIG.
O.D.:	1/8" [0.125"] (3.175 mm.)
I.D.:	0.065" (1.651 mm.)
WALL:	0.030" (0.762 mm.)
WEIGHT:	0.35 Lbs / Ft. (158 grams / 30.5 cm)
TEMP RANGE:	-25°F (-31.6° C) TO 125°F (51.6° C
PACKAGE:	12', 25' or 50' COIL ROLL. CLEANED & CAPPED OR CRIMPED

SPECIFICATIONS for Item# 19606-003-00 (3.16 OD Copper Tubing)

MATERIAL:	99.9% COPPER, 0.02% PHOSPHORS UNS C12200, ASTM-B68
PRESSURE RATING:	3500 PSIG.
O.D.:	3/16" [0.1875"] (4.1763 mm.)
I.D.:	0.1275" (3.329 mm.)
WALL:	0.030" (0.762 mm.)
WEIGHT:	0.058 Lbs / Ft. (263 grams / 30.5 cm)
TEMP RANGE:	-25°F (-31.6° C) TO 125°F (51.6° C
PACKAGE:	12', 25' or 50' COIL ROLL. CLEANED & CAPPED OR CRIMPED





Unless ordered special, all copper tubing will be shipped in a 12" dia. coil with the ends either capped (image right) or crimped (image Left) or both ways while being cut to length as ordered.

UNLESS OTHERWISE SPECIFIED DIMS ARE IN INCHES. TOLERANCES ARE.
0.X ±0.015 ANGLES FRACTIONS
0.XX ±0.010 ± 0.5° ± 1/64
0.XXX ±0.005
INTERPRET GD&T DIMS AND TOLS PER ASME 14.5
63

THIRD ANGLE PROJECTION.

<CR> KEY CHARACTERISTICS
<MA> PER CORP. DOC: ESR-001
NO. -

MOUNTAIN HIGH E&S CO. REDMOND OR. USA

ISSUED:	4-23-96	MATERIAL:	N/A
DRAWN:	4-23-96	FINISH:	N/A
ENGINEER: MJG	DATE	CLEAN:	N/A
APPR:	DATE	MARKING:	N/A

TUBE; HIGH-PRESSURE COPPER

DWG. #: E-930001 REV B

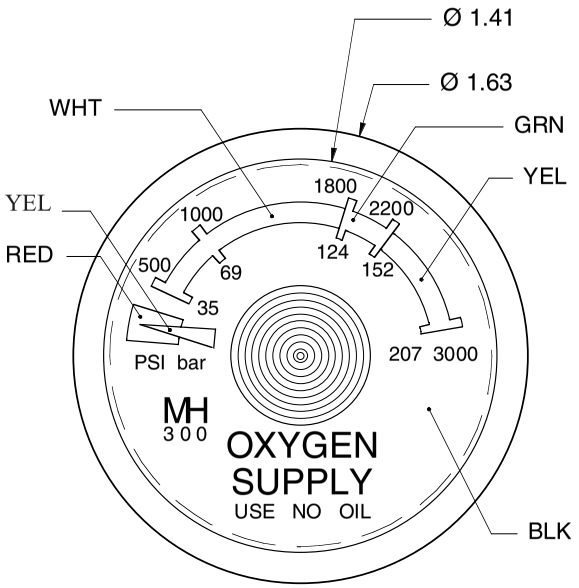
SIZE A | SHEET 1 OF 1 | DO NOT SCALE DRAWING

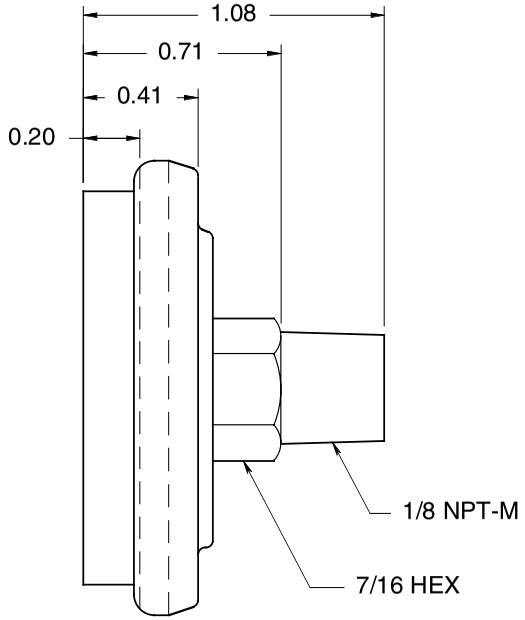
SPECIFICATIONS

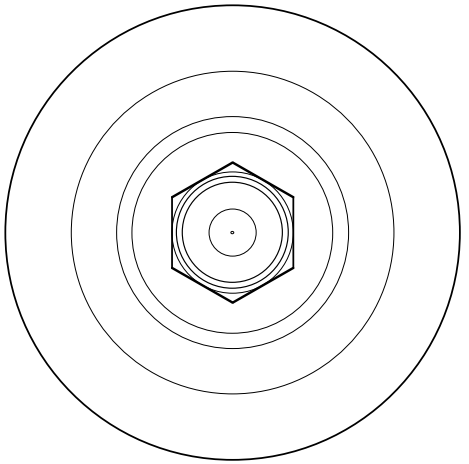
MATERIAL:	BRASS, SS & Acrylic
MAX PRESSURE:	207 bar (3000 PSIG.)
OPERATING RANGE:	152 bar (0-2200 PSIG.)
SAFETY FACTOR:	3:1
REAR AXIAL PORT:	1/8 NPT-M
TEMP RANGE:	-25°F TO 225°F
OEM VEN CODE:	1057

REVISION HISTORY

REV	DATE	E. C. O. / APPR.	NOTES
A	04-07-00	PLM	CHANGED TO NEW FORMAT
B	09-20-00	PLM	CHANGED TO SHOW PROPER DETAIL ON GAUGE
C	11-28-00	PLM	ADDED COLOR DETAIL ON GAUGE DIAL (WAS DWG. NO. E900130)







TEXT ON DIAL IS WHT ON BLK

FOR REFERENCE ONLY

UNLESS OTHERWISE SPECIFIED DIMS ARE IN INCHES. TOLERANCES ARE.
0.X ±0.015 ANGLES ± 0.5° FRACTIONS ± 1/64
0.XX ±0.010
0.XXX ±0.005
INTERPRET GD&T DIMS AND TOLS PER ASME 14.5
63

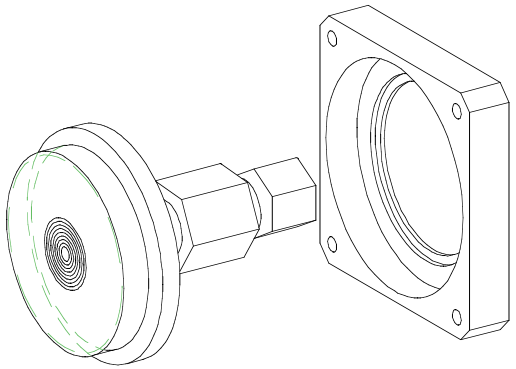
THIRD ANGLE PROJECTION.

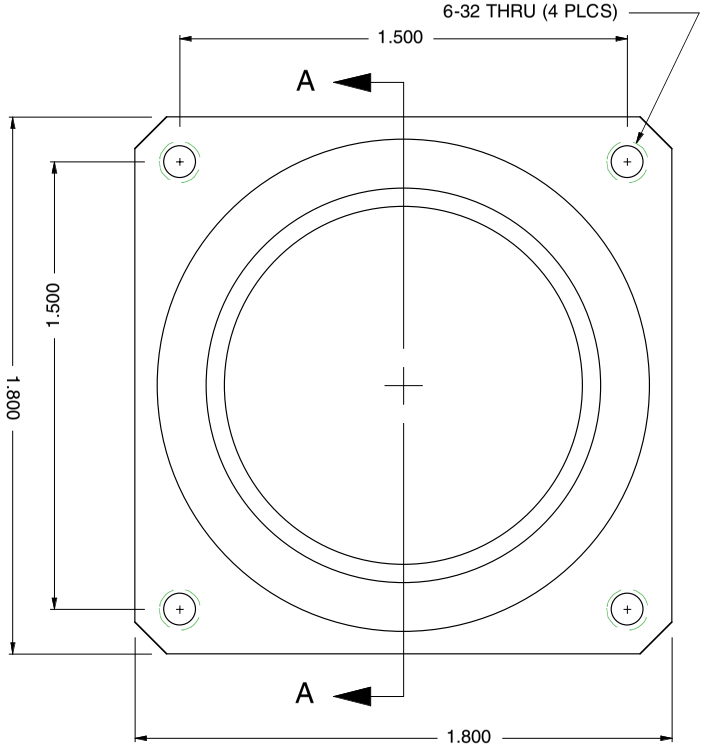
<CR> KEY CHARACTERISTICS
<MA> PER CORP. DOC: ESR-001
NO. -

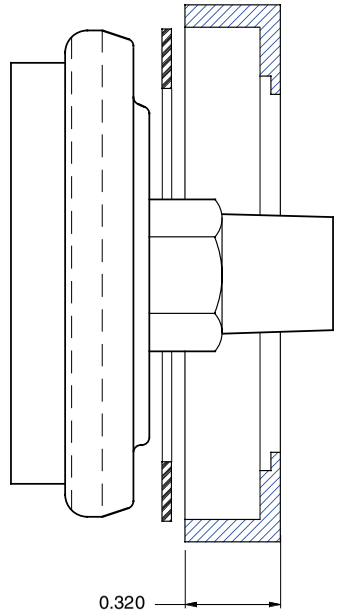
MOUNTAIN HIGH E&S CO.
REDMOND, OR. USA

ISSUED:	04-26-96		GAUGE: 1.4" 1/8 NPT REAR-MOUNT
DRAWN: PLM	04-26-96		DWG. #: 9500-003 REV C
ENGINEER:	DATE		
APPR:	DATE		SIZE A SHEET 1 OF 1 DO NOT SCALE DRAWING

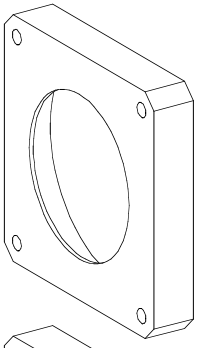
REVISION HISTORY			
REV	MO-DA-YR	E. C. O. / APPR.	NOTES
-	12-10-00	PLM	INITIAL RELEASE



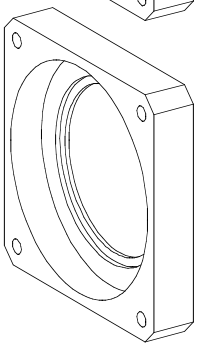




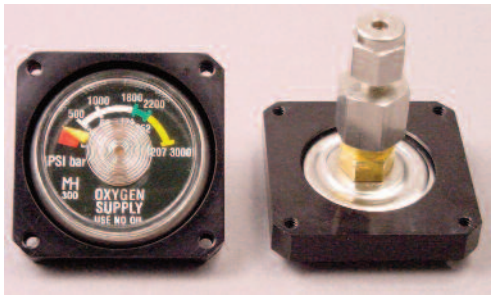
A-A



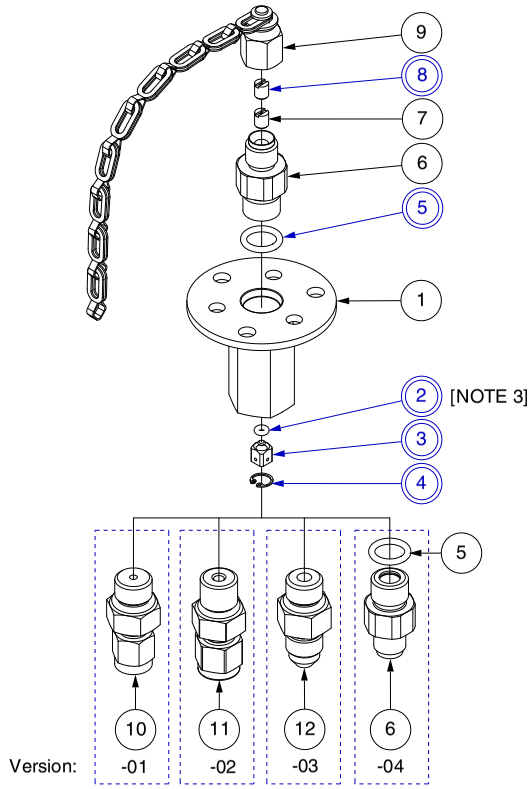
VIEW OF REAR



VIEW OF FRONT



UNLESS OTHERWISE SPECIFIED DIMS ARE IN INCHES. TOLERANCES ARE. 0.X ±0.015 0.XX ±0.010 0.XXX ±0.005 ANGLES ± 0.5° FRACTIONS ± 1/64 63 INTERPRET GD&T DIMS AND TOLS PER ASME 14.5			THIRD ANGLE PROJECTION.	<CR> KEY CHARACTERISTICS PER CORP. DOC: ESR-001 <MA>	NO. -
				MOUNTAIN HIGH E&S CO. REDMOND, OR. USA	
ISSUED:	DATE	MATERIAL: NOTE 1		GAUGE MOUNT 1.5 (SCD)	
DRAWN: PLM	08-22-00	FINISH: NOTE 2		DWG. #: MH30-050-00	REV -
ENGINEER: PLM	08-22-00	CLEAN: NOTE 3			
APPR:	DATE	MARKING: NOTE 4		SIZE A SHEET 1 OF 1	DO NOT SCALE DRAWING



REVISION HISTORY			
REV	ECO NO. YYYY-MM-DD	NAME	NOTES
E0	2013-009 2013-09-18	SGO	Update 0CV02-0257-00 Check-Valve Body for extended internal thread (Was: Rev C, Is: Rev E0); Add .008 threaded orifice 00VEN-0021-00; Order BOM to reflect assembly sequence

NOTES:

1. Item 1 Bulkhead (0CV04-0304-00) may also use Revisions "-" or "A"

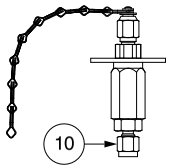
2. Item 6 Check-valve Body (0CV02-0257-00) may also use Revision "D".

[3] DO NOT LUBE Item 2 O-ring

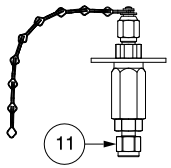
4. Assembly versions uniquely include Items 10, 11, 12 as indicated in Version Table. Version -04 includes a total of 2x each of Items 5 & 6 (O-ring & fitting); other versions require only 1 each. Items 10, 11, 12 each have O-ring included (Item 6 does not).

5. Items 2, 3, 4, 5, 8 included in Service Kit p/n KM100-1010-01

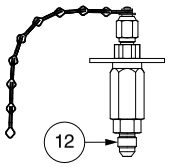
Version Table		
Part Number	Inboard Fitting	Ref
00BLT-1022-01	00HDW-0108-00	10
00BLT-1022-02	00HDW-0110-00	11
00BLT-1022-03	00HDW-1381-01	12
00BLT-1022-04	0CV02-0257-00	6



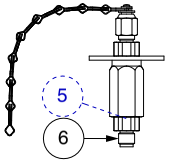
00BLT-1022-01



00BLT-1022-02



00BLT-1022-03



00BLT-1022-04

REF	Vers	QTY	Part Number	Rev	Description
1		1	0CV04-0304-00	B	Bulkhead, Check-Valve Body, Poppet Style, 2x SAE-4
2		1	09001-1003-70		O-ring, Silicone, 2-003, S70
3		1	0CV02-0201-00	A	Poppet, 0.25 Dia.
4		1	09007-0001-00		Retaining Ring, 1/4" Internal, SS
5	-04	2	09001-3904-70		O-ring, EPDM, 3-904 (SAE-4), E70
6	-04	2	0CV02-0257-00	E0	Check-Valve Body, Poppet Style, AN800 (3/8-24, 37....
7		1	00VEN-0021-00		Threaded Orifice Insert, #8-32 x .190L x .008 Orifice, ...
8		1	09150-0803-05		Threaded Filter Insert, #8-32 x .190, Brass
9		1	0CP01-0100-01	-0	Cap & Chain Assembly, AN-800-3
10	-01	1	00HDW-0108-00		SAE-4M x 1/8" Tube Adapter, Brass
11	-02	1	00HDW-0110-00		SAE-4M x 3/16" Tube Adapter, Brass
12	-03	1	00HDW-1381-01		SAE-4M x JIC-4 37° Flare Adapter, SS

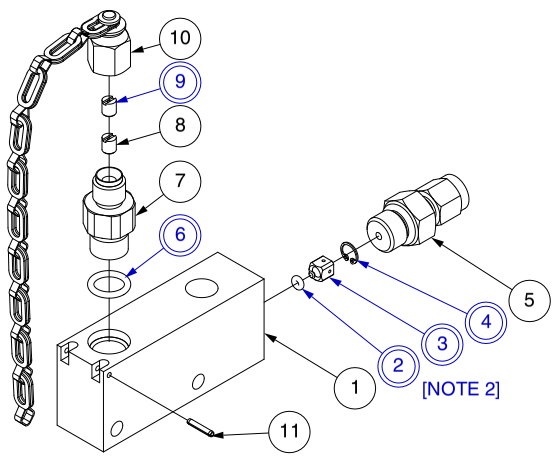
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES. TOLERANCES ARE:
0.X ±0.015 ANGLES ±0.5°
0.XX ±0.010 FRACTIONS ±1/64
0.XXX ±0.005
63
INTERPRET GD&T PER ASME 14.5
THIRD ANGLE PROJECTION
DO NOT SCALE DRAWING

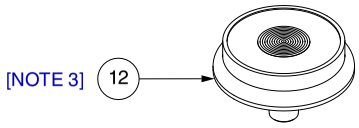
DRAWN SGO 2013-07-30
CHECKED
ENGINEER
APPROVED

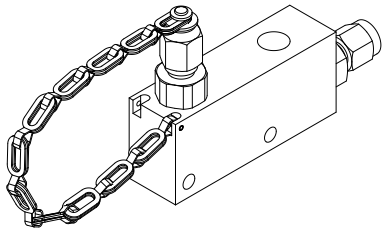
MOUNTAIN HIGH E&S CO.
REDMOND, OR. USA

DWG TITLE: Assembly, Bulkhead Refill, AN-800 Version Matrix
DWG NUMBER: 00BLT-1022-xx
DWG REV.: E0
CAD FILE
INV. PART NUMBER: 00BLT-1022-xx
PRODUCT NAME
DWG FORMAT: ESR-002 Rev H [12]
DWG SCALE
DWG SHEET: 1 OF 1
DWG SIZE: A

REVISION HISTORY			
REV	ECO NO. YYYY-MM-DD	NAME	NOTES
F0	2013-009 2013-09-18	SGO	Update 0CV02-0257-00 Check-Valve Body for extended internal thread (Was: Rev C, Is: Rev E0); Add .008 threaded orifice 00VEN-0021-00; Order BOM to reflect assembly sequence
G0	2015-006 2015-02-23	SGO	Change Item 2 O-ring: was 09001-1003-70 (Silicon), is 09001-3003-70 (EPDM)







NOTES:

1. Item 7 Check-valve Body (0CV02-0257-00) may also use Revision "D"

[2] DO NOT LUBE Item 2 O-ring

[3] Do not assemble Item 12 Gauge - customer will install in field

4. Items 2, 3, 4, 6, 9 included in Service Kit p/n KM100-1010-01

REF	QTY	Part Number	Rev	Description
1	1	00MAN-0028-00	A1	Manifold, Fill-Station, SAE-4
2	1	09001-3003-70		O-ring, EPDM, 2-003, E70
3	1	0CV02-0201-00	A	Poppet, 0.25 Dia.
4	1	09007-0001-00		Retaining Ring, 1/4" Internal, SS
5	1	00HDW-0108-00		SAE-4M x 1'8 OD Tube Compression, Brass
6	1	09001-3904-70		O-ring, EPDM, 3-904 (SAE-4), E70
7	1	0CV02-0257-00	E0	Check-Valve Body, Poppet Style, AN800 (3/8-24, 37.5°) x ...
8	1	00VEN-0021-00		Threaded Orifice Insert, #8-32 x .190L x .008 Orifice
9	1	09150-0803-05		Threaded Filter Insert, #8-32 x .190
10	1	0CP01-0100-01	-0	Cap & Chain Assembly, AN-800-3
11	1	09040-0003-00		Spring Pin, Ø1/16" x 3/8"
12	1	00CPG-1010-00		Pressure Gauge, Raw, MH-300

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES. TOLERANCES ARE:
0.X ±0.015
0.XX ±0.010
0.XXX ±0.005
ANGLES ± 3°
FRACTIONS ± 1/64
INTERPRET GD&T PER ASME 14.5
63

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

DRAWN SGO 2015-02-06
CHECKED
ENGINEER
APPROVED

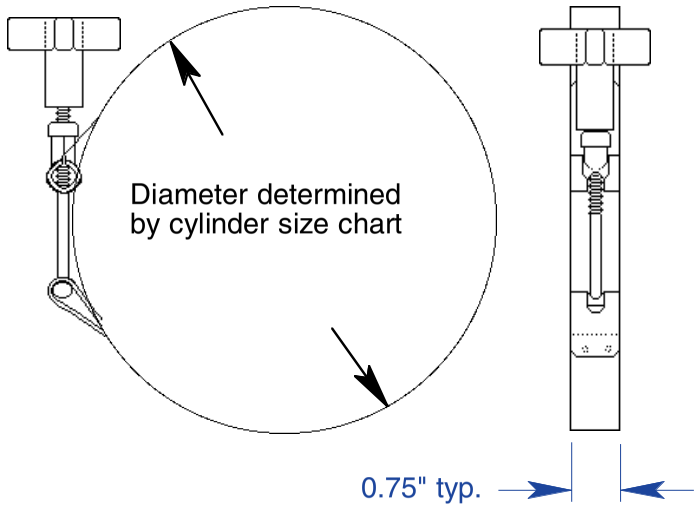
MH MOUNTAIN HIGH E&S CO.
REDMOND, OR. USA

DWG TITLE: Assembly, Deluxe Refill Station
DWG NUMBER: 00BLT-1020-00
DWG REV.: G0
CAD FILE
INV. PART NUMBER: 00BLT-1020-00
PRODUCT NAME
DWG FORMAT: ESR-002 Rev H [14]
DWG SCALE
DWG SHEET: 1 OF 1
DWG SIZE: A

Insert #: 5I BLT- 1020- 00

REVISION HISTORY			
REV	MO-DA-YR	E. C. O. / APPR.	NOTES
A	04-10-00	PLM	CHANGED TO NEW FORMAT & ADDRESS
B	08-27-2013	HBS / PLM	REVISED SELECTION CHART

SUPPLIER: MTN HIGH E&S CO.
REDMOND, OR. 97756 USA



SPECIFICATIONS;

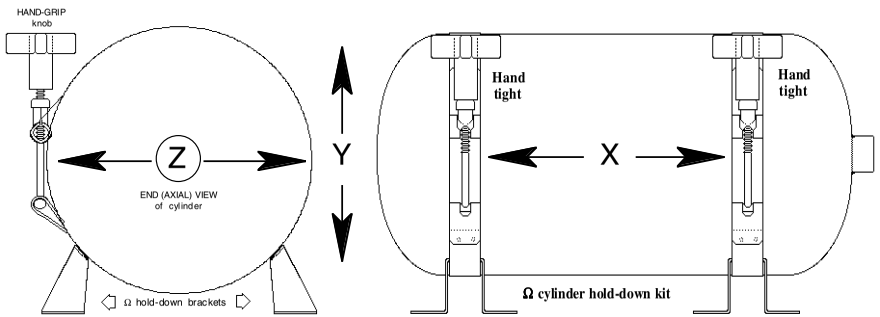
MATERIAL;	304 STN STL
THICK;	0.025" Typ.
T-BOLT:	1/4-28 UNJF 305 STN. STL.
GRIP KNOB:	Plastic with 1/4-28 brass insert
TEMP RANGE;	N/A

NOTICE

This "Ω" type cylinder hold-down mounting kit has not been tested, but has been designed to comply or exceed to the objectives of:

Z axis @ approx. 8 G. sin.
Y axis @ approx. 6 G. sin.
X axis @ approx. 2-4 G. sin. Dependant upon cylinder type

Cylinder Type	CMK Band ID	CMK Standard No Cushion Band Item #	CMK Quick Release No Cushion Band Item #	CMK Quick Release With Cushion Band Item #
AL-113, 180	3.25	00CMK-0010-01		
AL-113, 180	3.25		00CMK-0010-02	
AL-248, 415, 682	4.50		00CMK-0016-02	
AL-647	5.25	00CMK-0004-01	00CMK-0004-02	
CFF-480	4.75	00CMK-0022-01		00CMK-0022-03
CFFC-048	7.12			00CMK-0006-03
CFFC-022	5.25			00CMK-0004-03
KF-050	7.12			00CMK-0006-03
KF-011	3.75			00CMK-0002-03
KF-077	7.50		00CMK-0008-02	
KF-077	7.75			00CMK-0008-03
KF-115	9.00	00CMK-0012-01	00CMK-0012-02	
KF-115	9.25			00CMK-0012-03



UNLESS OTHERWISE SPECIFIED DIMS ARE IN INCHES.
TOLERANCES ARE:
0.X ±0.015 ANGLES ± 0.5° FRACTIONS ± 1/64
0.XX ±0.010
0.XXX ±0.005
63
INTERPRET GD&T PER ASME 14.5 FMT REV G

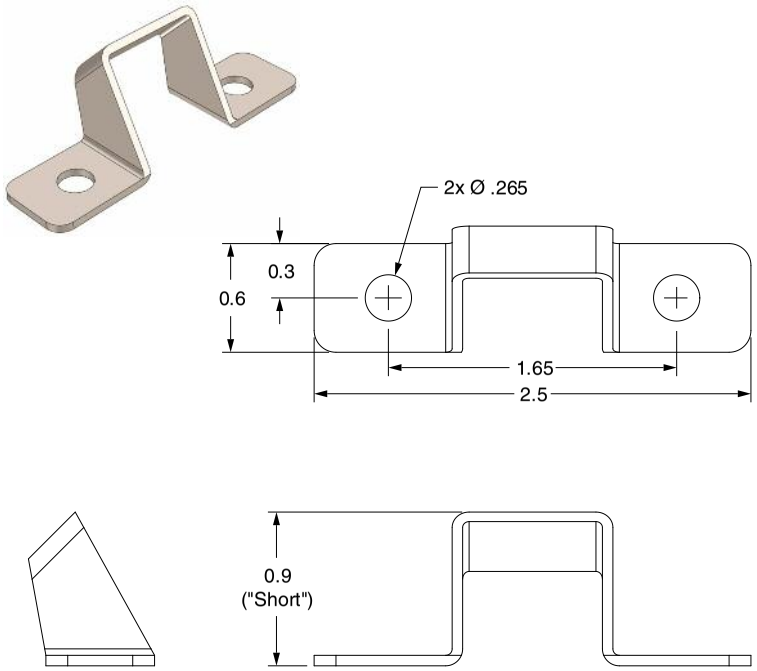
THIRD ANGLE PROJECTION
DO NOT SCALE DRAWING

MOUNTAIN HIGH E&S CO.
REDMOND, OR. USA

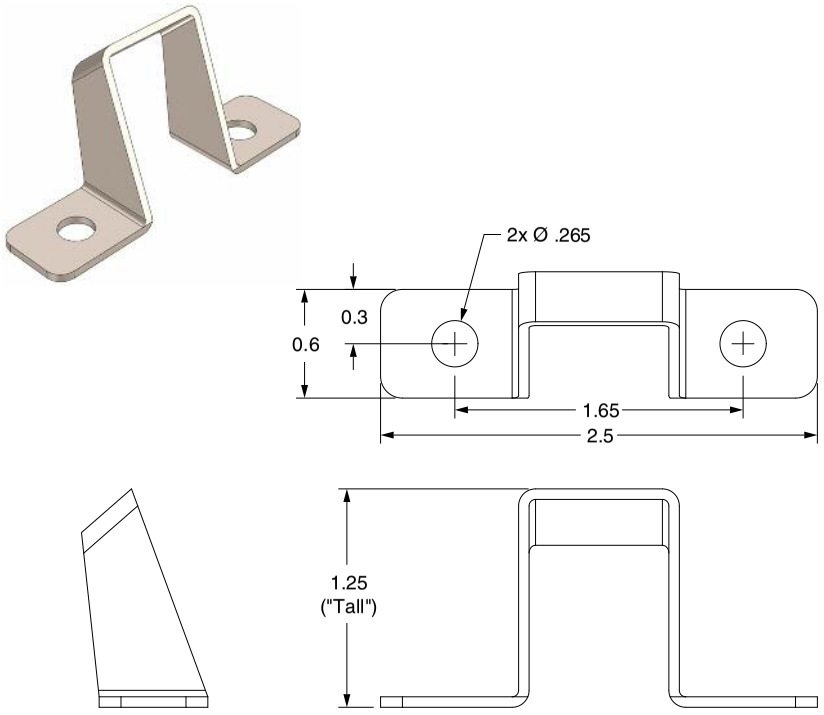
[KC] 00 NUMBER OF KEY CHARACTERISTICS IN THIS DRAWING / DOCUMENT PER MH DOC: ESR-001

ORIG.:	PLM / BAW	01-15-98	MATERIAL:	NOTE 1	CYLINDER Mounting Kit Chart (SCD)	
DRWN.:	PLM / BAW	01-15-98	FINISH:	NOTE 2	DWG. E930114	REV A SIZE A
ENG.:	PLM / BAW	01-15-98	CLEAN:	NOTE 3	INV: N/A	CAT: N/A
APPR.:	NAME	MO-DA-YR	MARKING:	NOTE 4	SHEET 1 OF 1	DC: 5ICMK-0003-00

REVISION HISTORY			
REV	ECO NO. YYYY-MM-DD	NAME	NOTES
-0	2013-022 2013-10-28	SGO	INITIAL RELEASE



00CMK-0030-00
Cylinder Mounting Bracket, Short
SCALE 1 : 1



00CMK-0032-00
Cylinder Mounting Bracket, Tall
SCALE 1 : 1

NOTES:

1. Material: 16ga (.060) T-304 Stainless Steel

2. See document 5ICMK-0003-00 Cylinder Mounting Kit Selection Chart for information on selecting a Cylinder Mounting Kit for a particular cylinder. Cylinder Mounting Brackets (feet) and Hand Grip Knobs are included with the Cylinder Mounting Kit.

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES. TOLERANCES ARE:
0.X ±0.015 ANGLES ±0.5°
0.XX ±0.010 FRACTIONS ±1/64
0.XXX ±0.005
63
INTERPRET GD&T PER ASME 14.5

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

MOUNTAIN HIGH E&S CO.
REDMOND, OR. USA

DRAWN SGO 2013-10-22	DWG TITLE	Cylinder Mounting Brackets, Omega Style, Short/Tall [SCD]			
CHECKED MDG 2013-10-24	DWG NUMBER	5ICMK-0004-00		DWG REV.	-0
ENGINEER PLM 2013-10-25	CAD FILE		INV. PART NUMBER 00CMK-0030-00 00CMK-0032-00	PRODUCT NAME	
APPROVED HBS 2013-10-24	DWG FORMAT: ESR-002 Rev H [13]	DWG SCALE 1:1	DWG SHEET 1 OF 1	DWG SIZE	A

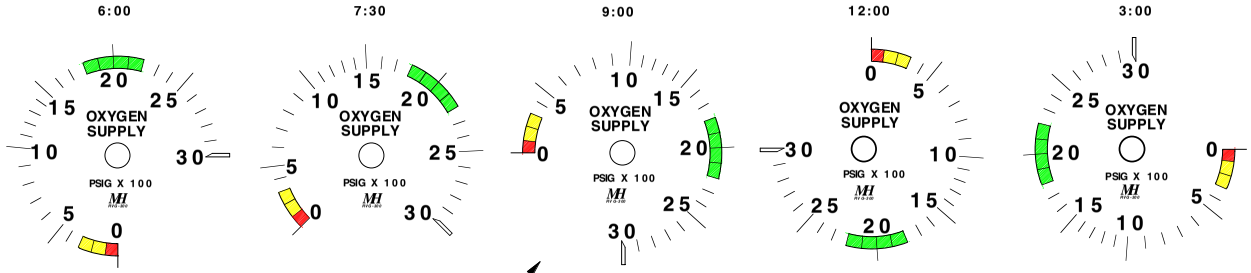
REVISION HISTORY			
REV	DATE	E. C. O. / APPR.	NOTES
A	02-22-97		ORIGINALRELEASE
B	03-22-00	PLM	UPDATED WITH NEW FORMAT & ADDRESS
C	11-22-00	PLM	UPDATED TO SHOW PROPER DIAL/SCALE DETAIL & OPTIONS

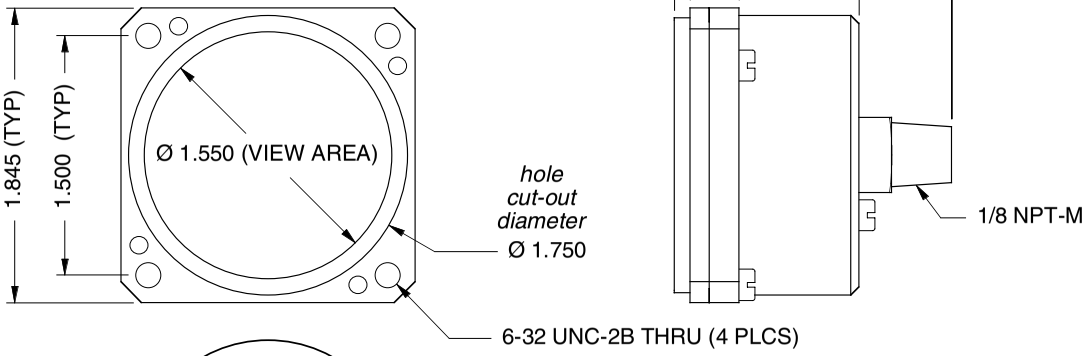
Specifications

Construction: *Main Body 6061-T6 Alum.*
Anodize Per MIL-A-8625 Type II
Connection Brass

Weight: *3.0 oz Max*

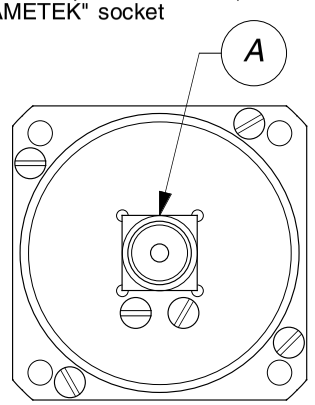
Dial Ranges:
0 - 15 psig. FS zero @ 7:30
0 - 30 psig. FS zero @ 7:30
0 - 60 psig. FS zero @ 7:30
0 - 100 psig. FS zero @ 7:30
0 - 200 psig. FS zero @ 7:30
0 - 2000 psig. FS zero @ 7:30
0 - 3000 psig. FS zero @ 9:00 (standard issue)

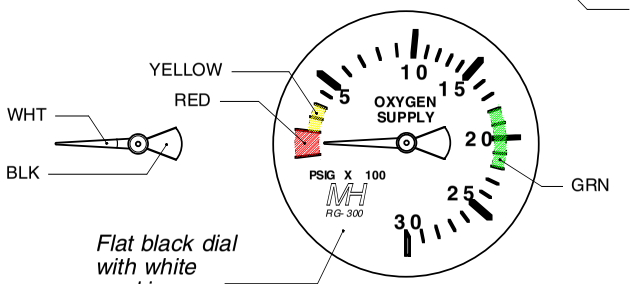




A: 0.475" Square flats (29 mm.) for " NOSHOCK" socket.

A: 0.440" Square flats 7/16 (11 mm.) for "AMETEK" socket





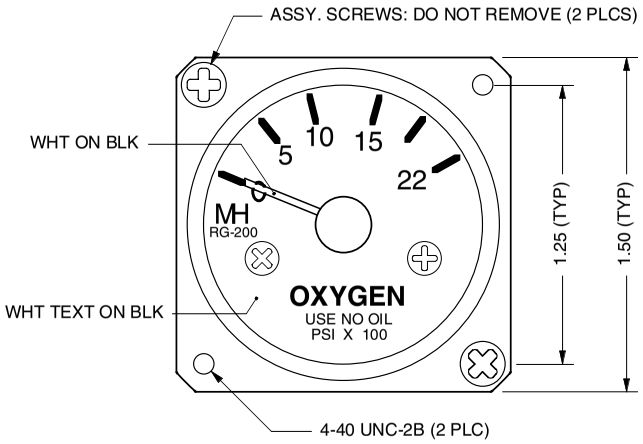
Flat black dial with white markings and numbers

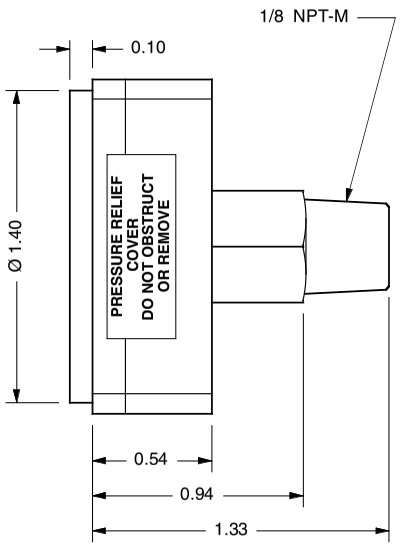
UNLESS OTHERWISE SPECIFIED DIMS ARE IN INCHES. TOLERANCES ARE. 0.X ±0.015 ANGLES FRACTIONS 0.XX ±0.010 ± 0.5° ± 1/64 0.XXX ±0.005 INTERPRET GD&T DIMS AND TOLS PER ASME 14.5	THIRD ANGLE PROJECTION.	<CR> KEY CHARACTERISTICS <MA> PER CORP. DOC: ESR-001	NO. -
		MOUNTAIN HIGH E&S CO. REDMOND, OR. USA	
ISSUED:	DATE	N1.75" (4.45 cm) PRESSURE GAUGE	
DRAWN: PLM	02-22-97	DWG. #: E-900104 (RG-300)	REV C
ENGINEER: PLM	02-22-97		
APPR:	DATE	SIZE A SHEET 1 OF 1	DO NOT SCALE DRAWING

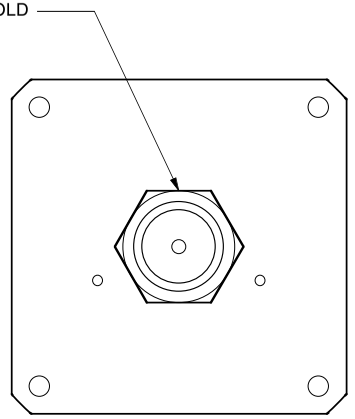
REVISION HISTORY			
REV	DATE	E. C. O. / APPR.	NOTES
A	06-02-97	PLM	REVISED TO SHOW NEW DIMENTIONS
B	05-01-00	PLM	REVISED WITH NEW FORMAT
C	12-12-00	PLM	REVISED TO SHOW CORRECT DIAL DETAIL (WAS DWG. NO. E-900105)

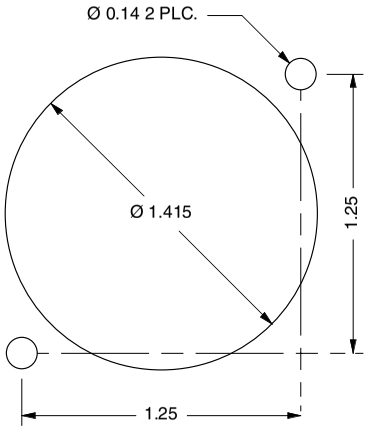
General Specifications

Service Gas:	Oxygen per MIL-027210, Type 1
Operating Pressure:	0-2200 psig (152 bar)
Construction:	Main Body 6061-T6 Alum. Anodize Per MIL-A-8625 Type II Connection Brass (1/8 NPT-M)
Safety Factor:	4:1
Weight:	2.0 oz Max









Mounting hole template

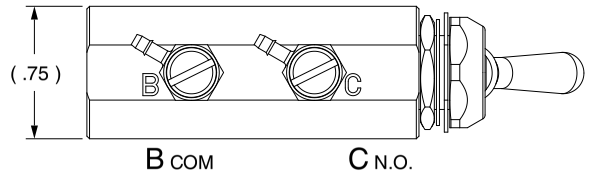
FOR REFERENCE ONLY
DO NOT USE FOR PRODUCTION ORDERING

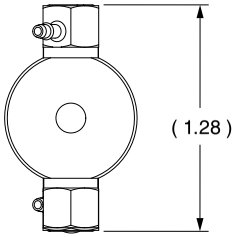
UNLESS OTHERWISE SPECIFIED DIMS ARE IN INCHES. TOLERANCES ARE.
0.X ±0.015 ANGLES ± 0.5° FRACTIONS ± 1/64
0.XX ±0.010
0.XXX ±0.005
INTERPRET GD&T DIMS AND TOLS PER ASME 14.5
63
THIRD ANGLE PROJECTION.

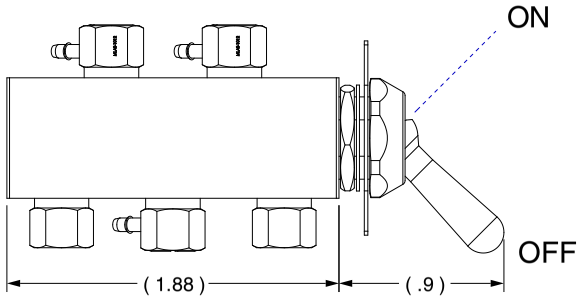
<CR> KEY CHARACTERISTICS NO. -
<MA> PER CORP. DOC: ESR-001

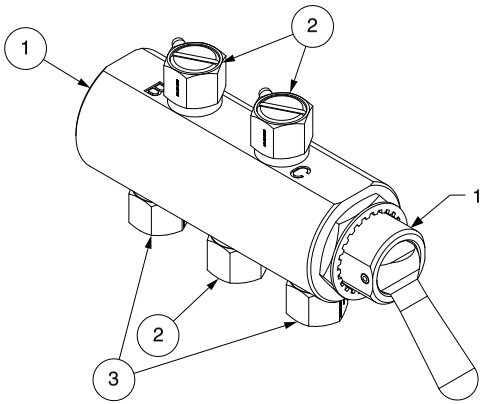
MOUNTAIN HIGH E&S CO.
REDMOND, OR. USA

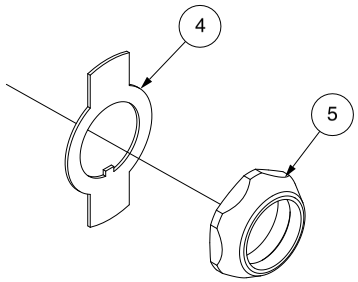
ISSUED:	09-27-96	1.5" IP TYPE CYL. PRESS. GAUGE
DRAWN: PLM	09-27-96	DWG. #: 9500-002 REV C
ENGINEER: PLM	09-27-96	SIZE A SHEET 1 OF 1 DO NOT SCALE DRAWING
APPR:	DATE	

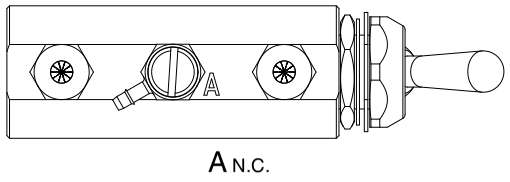












REF	QTY	Part Number	Rev	Description
1	1	19026-0005-00		Switch, Pneumatic, 4-way
2	3	19055-0002-00		Banjo Fitting, Adjustable, 90° elbow, #10-32 x Barb, 1/16 ID T
3	2	09025-0023-00		Breather, #10-32
4	1	50001-0003-00		Switch Plate, "On/Off"
5	1	19027-0006-00		Dress Nut, Black Anodized, 15/32-32 THD
6	20	19600-0005-00		PolyUrethane Tubing, 1/8" OD, Yellow [Qty Feet]
7	20	19600-0006-00		PolyUrethane Tubing, 1/8" OD, Orange [Qty Feet]
8	20	19600-0007-00		PolyUrethane Tubing, 1/8" OD, Gray [Qty Feet]

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES. TOLERANCES ARE:
0.X ±0.015 ANGLES ±0.5°
0.XX ±0.010 FRACTIONS ±1/64
0.XXX ±0.005
63
INTERPRET GD&T PER ASME 14.5

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

DRAWN SGO 2013-12-07
CHECKED
ENGINEER
APPROVED

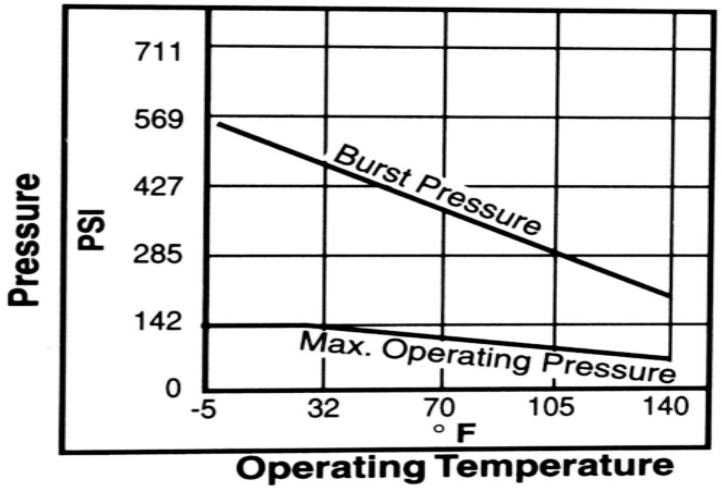
MOUNTAIN HIGH E&S CO.
REDMOND, OR. USA

DWG TITLE: Assembly, Kit, Switch, Pneumatic, 4-way [SCD]
DWG NUMBER: 5I000-0118-00
DWG REV.: A0
CAD FILE
INV. PART NUMBER: APCR0-0118-00
PRODUCT NAME
DWG FORMAT: ESR-002 Rev H [13]
DWG SCALE
DWG SHEET: 1 OF 1
DWG SIZE: A

5I930-0001-00

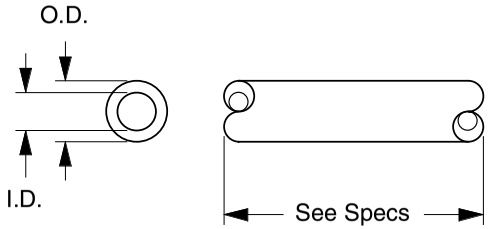
REVISION HISTORY			
REV	DA-MO-YR	E. C. O. / APPR.	NOTES
A	04-07-00	PLM	CHANGED TO NEW FORMAT & ADDRESS
B	17-04-13	PLM	ADDED IMAGES
C	18-08-14	PLM	ADDED DUROMETR COLUMN

Burst Pressure Characteristics Curve



General Specifications

MATERIAL:	POLYURETHANE
COLOR:	> See Table
MAX. OPERATING PRESSURE:	> See Chart
BURST PRESSURE:	> See Chart
Outside Diameter, O.D.:	> See Table
Inside Diameter, I.D.:	> See Table
MIN. BENDING RADIUS:	> See Table
TEMP RANGE:	> See Chart
LENGTH & PACKAGE:	By the Foot or 20 or 30' Roll



1 2 3 4 5 6

Polyurethane Tubing

Li	MH Item Number	O.D	I.D	COLOR	Durometer	Min. Bend Radius
1	19600-0009-00	(0.250) 6.35mm	(0.125) 3.2mm	CLR	85	(0.590) 15mm
2	19600-0003-00	(0.236) 6.0mm	(0.157) 4mm	CLR Blue	95	(0.590) 15mm
3	19600-0002-00	(0.157) 4mm	(0.098) 2.5mm	CLR Red	95	(0.394) 10mm
4	19600-0005-00	(0.125) 3.2mm	(0.079) 2mm	Yellow	95	(0.394) 10mm
5	19600-0007-00	(0.125) 3.2mm	(0.079) 2mm	Slate	95	(0.394) 10mm
6	19600-0006-00	(0.125) 3.2mm	(0.079) 2mm	Orange	95	(0.394) 10mm

UNLESS OTHERWISE SPECIFIED DIMS ARE IN INCHES. TOLERANCES ARE.
0.X ±0.015 ANGLES FRACTIONS
0.XX ±0.010 ± 0.5° ± 1/64
0.XXX ±0.005
63
INTERPRET GD&T DIMS AND TOLS PER ASME 14.5

THIRD ANGLE PROJECTION.

<CR> KEY CHARACTERISTICS NO. -
<MA> PER CORP. DOC: ESR-001

MH MOUNTAIN HIGH E&S CO. REDMOND, OR. USA

ISSUED:	04-26-00	
DRAWN: PLM	04-26-96	
ENGINEER:	DATE	
APPR:	DATE	

LP POLYURETHANE TUBING, SCD

DWG. #: E-930005 REV C

SIZE A SHEET 1 OF 1 DO NOT SCALE DRAWING

General Specifications

Regulator performance

Inlet operating pressure range:	34.5 to 172 bar (500 to 2500 psig.)
Absolute Max inlet pressure:	207 bar (3000 psig.)
Gas Medium compatability:	Oxygen, Air, Nitrogen
Nominal lock-up static (no-flow) pressure:	1.38 – 1.86 bar (20 – 27 psig.)
Dynamic (flowing @ ~25 liter/minute flow:	0.83 – 1.03 bar (12 – 15 psig.)
Max free-flow through output port:	~100 liter/minute
Operating temperature range:	-20 to +50 °C
Storage temperature range:	-45 to +65 °C
Operating Altitudes:	-2K to +35K ft. SPA
Operating Humidity:	0 to 93% RH non condensing

Pneumatic control

Dynamic & static control pressure for desmodromic actions:	0.80 to 1.25 bar (11.6 to 18.1 psig.)
Transitional flow requirements:	< 0.0625 liter/min.
Transient time from off to on (down/up-down)	~ 225 ms. Temperature dependant[1]

Construction Material

Main Body & Internal non HP wetted Parts:	6066-T6[2] Machined Anodized Aluminum[3]
Internal HP wetted parts:	CDA-360 Cartridge Brass
Internal control orifices:	Brass captured sapphire ruby cartridge
Internal filters:	Brass captured dual mesh stainless steel screens, 43 micron
Seals & O-rings:	PTFE, FKM, fluorocarbon, EPDM, Polyurethane & Fluoro-Silicone
Other fittings & parts:	Brass, FRP ABS & Steel

Physical Properties

Weight:	383 grams (13.5 Oz.) Regulator Assy. only
Height:	8.6 cm (3.38”)
Depth:	7.8 cm (3.08”) Including fitting protrusions
Width:	5.8 cm (2.3”) Including fitting protrusions

Endurance & Reliability Statement

Estimated Mean Time Before Failure (EMTBF) (MTBF)	~3,650 Hours or ~2,735 full flowing on-off cycles

Environmental Testing Compliance Criteria

RTCA DO160 section series	See next sheet
RTCA DO178 section series	N/A

Regulatory Statement

FCC Part 15 (unintended emissions)	N/A
FAA part 23, 25	Specific to application.

NOTES

1) Operating between 0 ~ 48 °C
2) ASTM B209 6061-T651 ALUMINUM
3) Anodized Per MIL-A-8625 TYPE II SLATE

This is a list of known RTCA DO-160 tests that will most likely applicable for FAA STC applications.
This chart was derived from experiences with past certified applications and programs.

DO-160 Sections Applicable for FAA STC		**Yes**	**No**
Sec 04.0:	Temperature & Altitude	*	
Sec 05.0:	Temperature Variation	*	
Sec 06.0:	Humidity	*	
Sec 07.0:	Operational Shocks & Crash Safety	?	
Sec 08.0:	Vibration	*	
Sec 09.0	Explosion Proof-ness		*
Sec 10.0:	Water Proof-ness		*
Sec 11.0:	Fluids Susceptibility		*
Sec 12.0:	Sand & Dust		*
Sec 13.0:	Fungus Resistance	?	
Sec 14.0:	Salt Spray		*
Sec 15.0:	Magnetic Effect §		*
Sec 16.0:	Power Input §		*
Sec 17.0:	Voltage Spike §		*
Sec 18.0:	Radio Frequency Conducted Susceptibility-Power Inputs §		*
Sec 19.0:	Induced Signal Susceptibility §		*
Sec 20.0:	Radio Frequency Susceptibility (Radiated & Conducted) §		*
Sec 21.0:	Emission of Radio Frequency Energy §		*
Sec 22.0:	Lightning Induced Transient Susceptibility §		*
Sec 23.0:	Lightning Direct Effects §		*
Sec 24.0:	Icing		*
Sec 25.0:	Electrostatic Discharge §		*

§ DO-160G Section updates

Sec 15: Magnetics Effects
Sec 16: Power Input – AC & DC up to 45 kVA.
Sec 17: Voltage spike
Sec 18: Radio Frequency Conducted Susceptibility
Sec 19: Induced Signal Susceptibility
Sec 20: Radiated & Conducted RF Susceptibility
Sec 21: Radiated & Conducted RF Emissions
Sec 22: Lightning Induced Transient Susceptibility
Sec 23: Lightning Direct Effects
Sec 25: Electrostatic Discharge

Servicing The PCR-2

Servicing interval

The service interval for the PCR-2 is predicated on, among many factors, the time between service and frequency of use, i.e. number of on/off cycles the PCR-2 endures between servicing. The estimated number of on/off cycles the PCR-2 is good for before a deviation of operating specifications are observed where servicing is recommended is approximately 3250 full-on flowing sustain then off cycles.

The best and most convenient time is to have the PCR-2 serviced at the same time the cylinder is hydro-tested at a maximum interval of about three years.

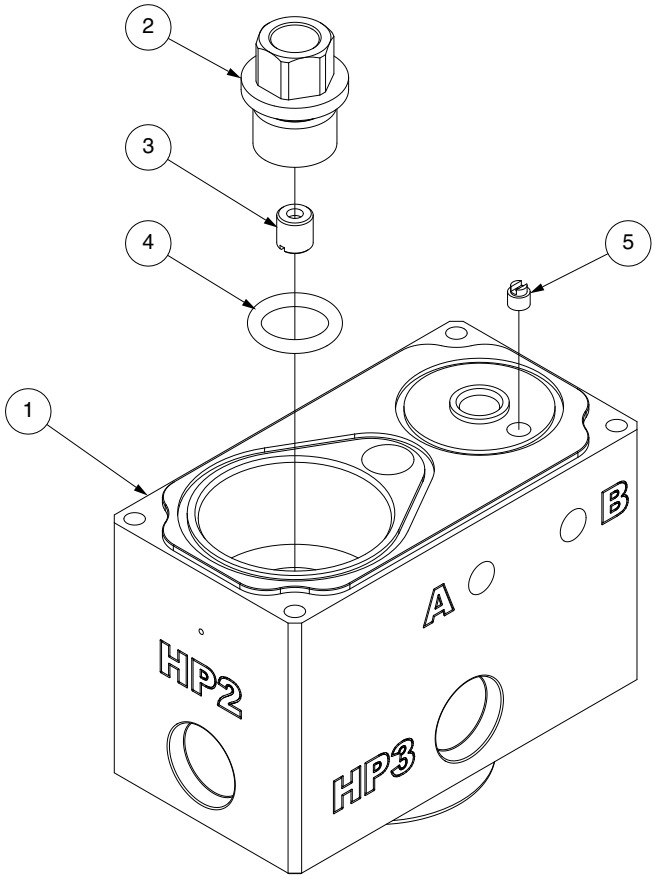
The parts that have any appreciable wear would be the pneumatic control switch, the main seal on the on/off 'pop-up' piston valve and the main regulator seat in the RCR-2 itself. Parts that have a secondary wear factor are the O-rings associated with the 'pop-up' piston valve and the regulator piston.

The main regulator inlet seat, in time and usage, will wear in such a way the regulator's static / non-flowing 'lock-up' pressure may creep past the specified limits. In this case, the dynamic 'flowing' pressure may still be within the specified limits allowing the unit to supply the proper amount of oxygen to all stations in use. If the static pressure goes beyond ~ 55 - 65 psig. The LPRD will relive the over pressure supply to ambient.

Servicing:

It is highly recommended that the PCR-2 be repaired and serviced by MH or an authorized service center.

REF	-00	-02	Part Number	Rev	Description
1	1	1	0PCR0-0205-00	A1	PCR-2 Body, Desmodromic
2	1	1	0RGX0-0206-02	B1	Regulator Inlet Seat, Flat Type
3	2	2	09025-0024-00		Threaded Filter Insert, #10-32 x .195
4	5	5	09001-3904-70		O-ring, EPDM, 3-904 (SAE-4), E70
5	1	1	19050-3020-00		Orifice, Threaded Insert, M3x0.5 x .120 x Ø.002, Brass
6	1	1	09001-3610-70		O-ring, EPDM, 32mm x 1mm, E70
7	1	1	09001-3608-70		O-ring, EPDM, 20mm x 1.0mm, E70
8	A/R	A/R	09030-0004-10		Shim, Flat Washer Type, SS, Ø.875 od x Ø.463 id x .010
9	A/R	A/R	09030-0004-16		Shim, Flat Washer Type, SS, Ø.875 od x Ø.463 id x .016
10	A/R	A/R	09030-0004-30		Shim, Flat Washer Type, SS, Ø.875 od x Ø.463 id x .030
11	1	1	09010-0042-00		Wave Spring, Ø.610 od x Ø.494 id x 9 turns x .317 wh
12	1	1	0RGX0-0235-02	J	Gas Reg Piston, Ball Type
13	1	1	09001-3020-70		O-ring, EPDM, 2-020, E70
14	1	1	09001-3006-70		O-ring, EPDM, 2-006, E70
15	1	1	09000-0002-00		Valve Seat Ball, PTFE[Teflon], SØ.156[5/32]
16	1	1	00IPR-0210-00	-1	IPR2/PCR2 Valve-Piston, Extended-Travel
17	1	1	09001-3016-70		O-ring, EPDM, 2-016, E70
18	2	2	09001-3004-70		O-ring, EDPM, 2-004, E70
19	1	1	09001-1003-60		O-ring, Silicone, 2-003, S60
20	1	1	0PCR0-0207-00	A1	PCR-2 Cap, Desmodromic
21	4	4	09100-0408-00		Capscrew, Socket Head, SS, #4-40 x 0.500[1/2]
22	1	1	5PCR0-0002-00	-0	PCR-2 Label
23	3	3	19035-0004-00		SAE-4 Port Plug, Socket
24	1	1	19035-0002-00		SAE-2 Port Plug, Round, Hex Socket, Brass
25	1	1	09001-3902-70		O-ring, EPDM, 3-902 (SAE-2), E70
26	1	1	19056-0604-00		One-Touch Fitting, 6mm tube x 1/8 BSPP, 90° Elbow
27	1	1	19050-0023-00		Orifice, Threaded Insert, #10-32 x .125 x Ø.003, Brass
28	3	3	19055-0002-00		Banjo Fitting, Adjustable, 90° elbow, #10-32 x Barb, 1/16 I...
29	1		0RGX0-0203-00	C1	Regulator Grip-Nut, CGA-540
30	1		0RGX0-0219-00	D1	Inlet Nipple, CGA-540 x SAE-4
31	2		09001-0011-90		09001-0011-90 (O-ring, Viton, 2-011, V90)
32	1		5LPCR-0011-90		Label, Spare O-ring, CGA-540 [09001-0011-90]
33	1	1			Zip-Lock Bag (Spare O-ring)
34		1	0RGX0-0205-00	D1	Regulator Grip-Nut, DIN-477
35		1	0RGX0-0223-01	B	Inlet Nipple, DIN-477-9, Euro Type CV
36		2	09001-3113-70		O-ring, EPDM, 2-113, E70
37		1	5LPCR-3113-70		Label, Spare O-ring, DIN-477 [09001-3113-70]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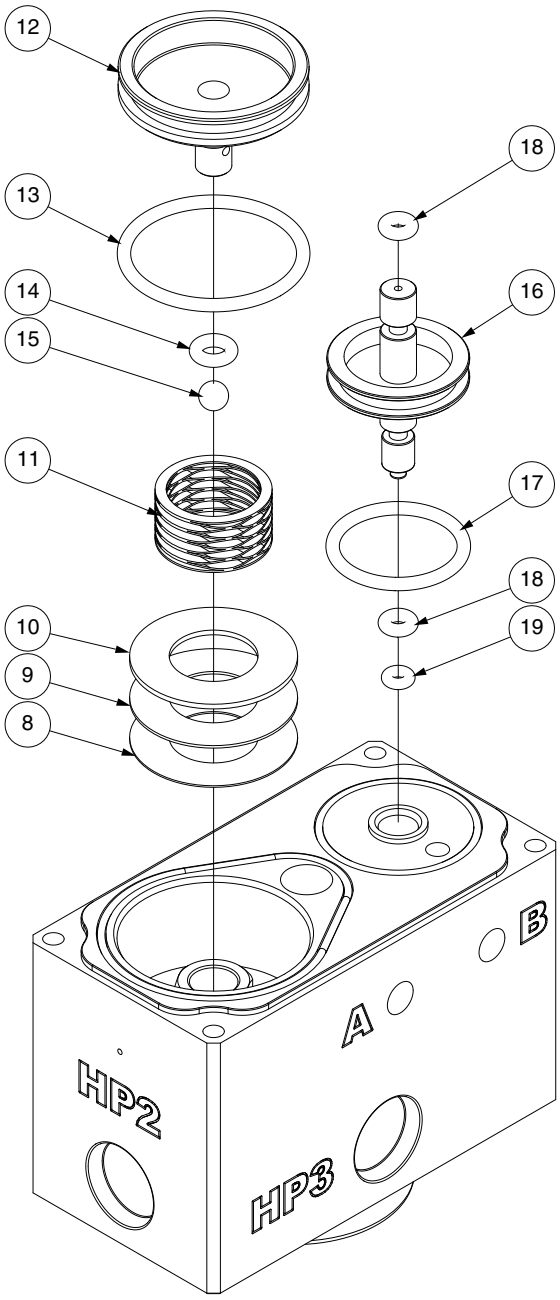
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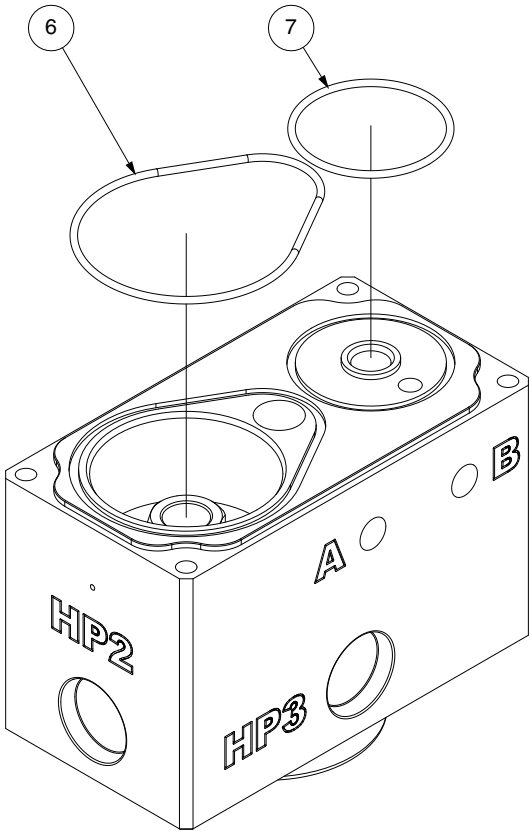
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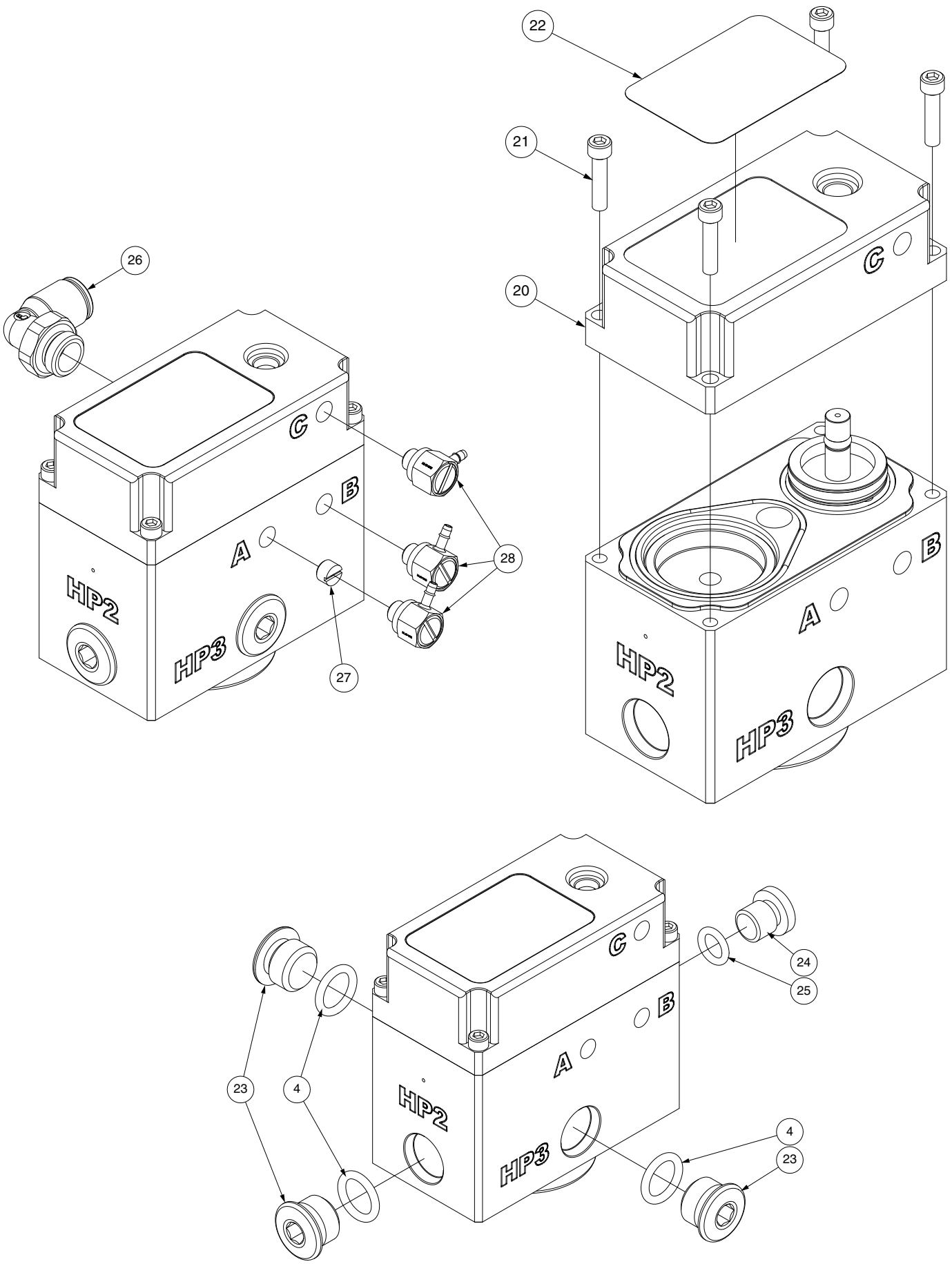
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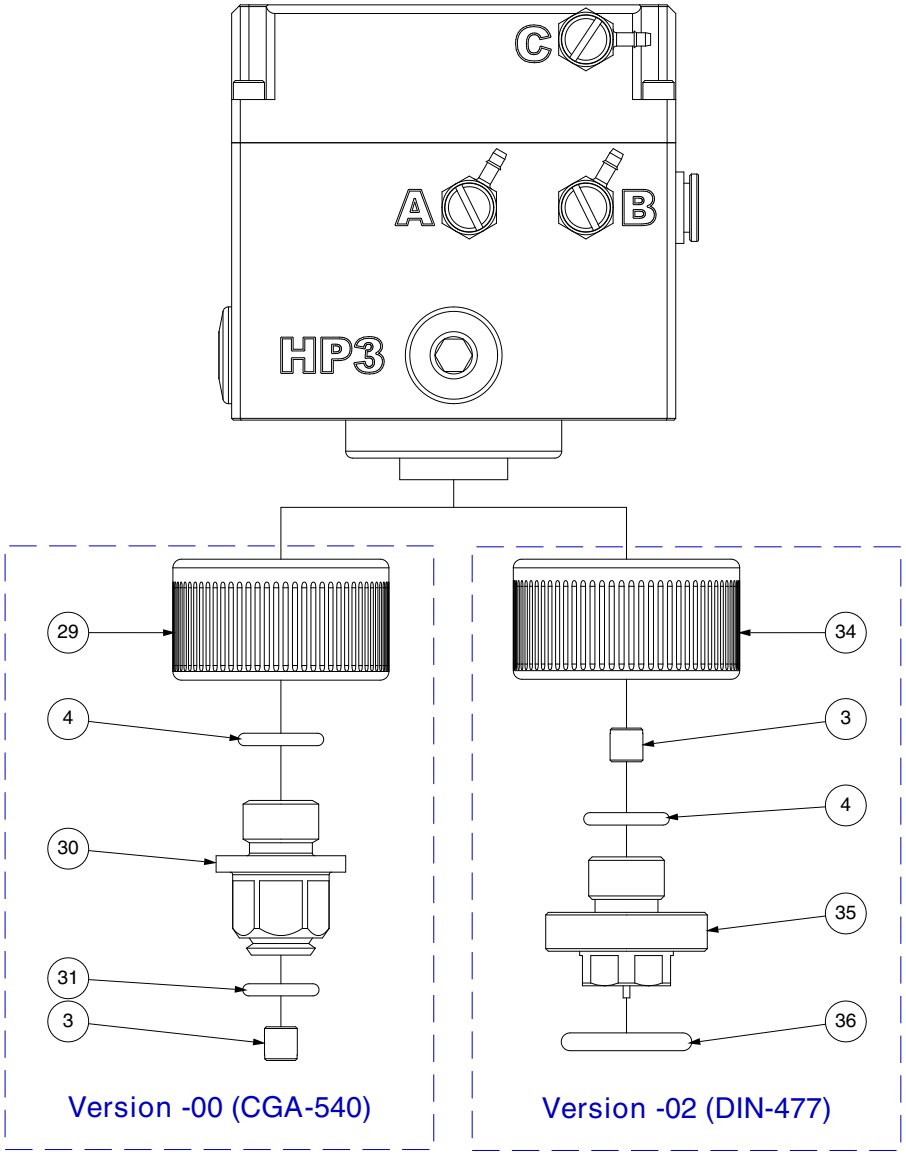
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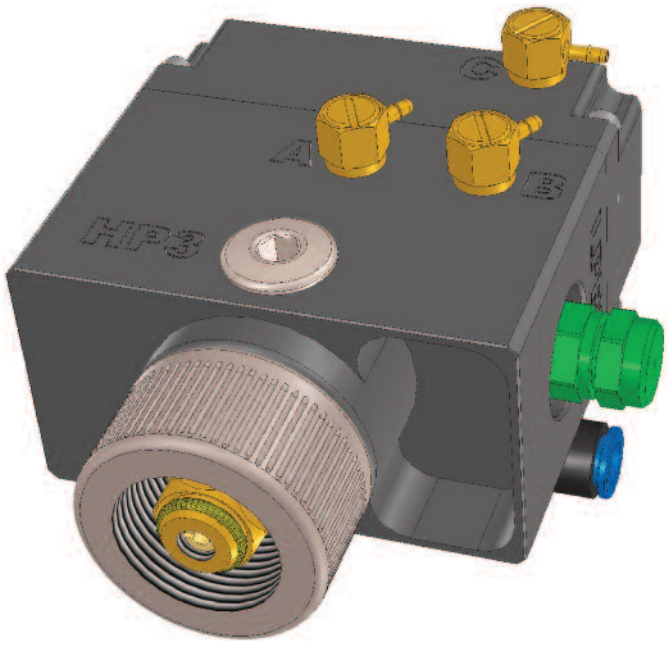
Version -00 (CGA-540)
Version -02 (DIN-477)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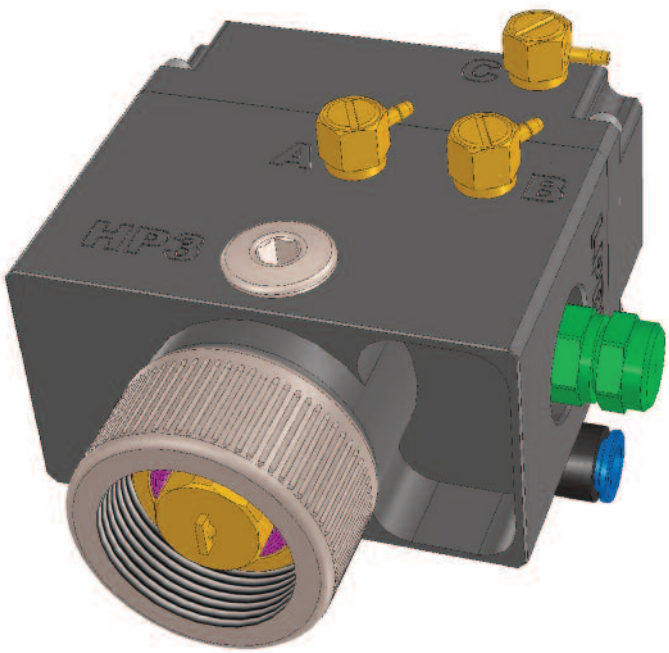
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MH
Aviation
Oxygen Systems
Since 1985