Aviation Oxygen Systems

MOUNTAIN HIGH
Equipment & Supply Company

RCV/RCR Manual and Description

Remote Controlled Valve/ Remote Controlled Regulator

For RCV w/ Versatile Porting, Manual Revision 5.0

RCV/RCR

RCV/RCR-2D

RCV/RCR-2DL

RCV/RCR-2DP

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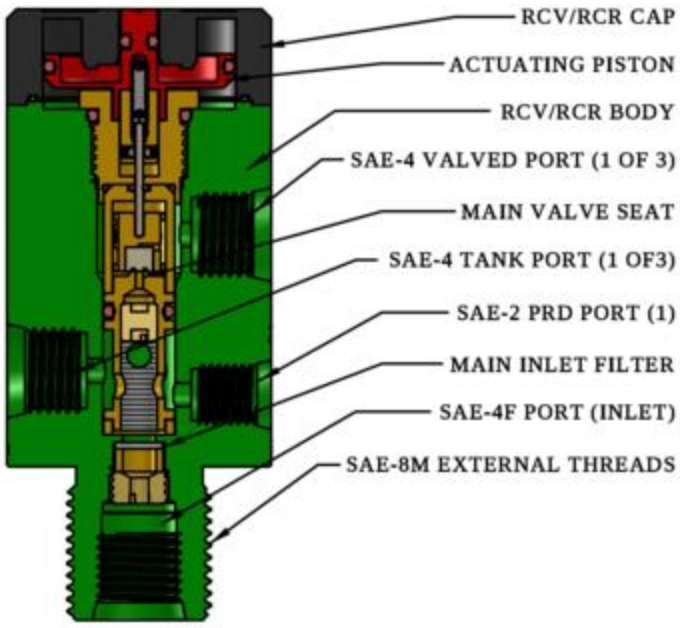
RCV/RCR MANUAL REVISION HISTORY			
REV	ECO NO. YYYY-MM-DD	NAME	NOTES
3.1	Unknown Unknown	??	Unreleased Found Archive
4.0	2025-001 2025-06-03	KQM	Initial Official Release
5.0	2026-004 2026-02-26	KQM	Revisions for new RCV Body w/ SAE-2 PRD Port & reformatted sections

SECTION 1: GENERAL INFORMATION

GENERAL DESCRIPTION:

The RCV/RCR is a remote controlled oxygen valve and regulator assembly intended for use in general aviation aircraft and designed to meet AEC-Q100 and DO-160 specifications. The RCV (Remote Controlled Valve) is the "main hex-body" valve device without any peripherals mounted to the ports. Once a main regulator has been mounted to any of the valved ports, it becomes an RCR (Remote Controlled Regulator). The RCV/RCR enables the user to switch the oxygen valve on and off via a switch in the cockpit (or optionally tied into the master switch) regardless of where the tank is mounted in the aircraft, hence the REMOTE Controlled Valve. The Regulator is attached directly to a valved port, so switching on the RCV sends pressurized oxygen through the pre-calibrated main regulator, enabling the flow of breathable oxygen to the users.



RCV SECTION

GENERAL THEORY OF OPERATION:

The design of the RCV/RCR is relatively simple. It is operated internally by pneumatic means utilizing a very small amount of the pressurized oxygen supply, regulated by a pilot regulator, to provided the necessary (normally static) pressure to operate (lift) the main internal piston that opens a high-pressure main valve-seat device inside the RCV body. The RCV/RCR has a dual purpose inlet port system that can be directly mounted to any cylinder that has an SAE-8 (3/4-16) female service port, or it can be remotely mounted via the SAE-4 (7/16-20) female inlet port centered just inside the SAE-8 external threads. The adjacent figure shows the RCV in the closed position with the pneumatic operation.

2 STAGE MAIN REGULATOR SECTION

MAIN REGULATOR:

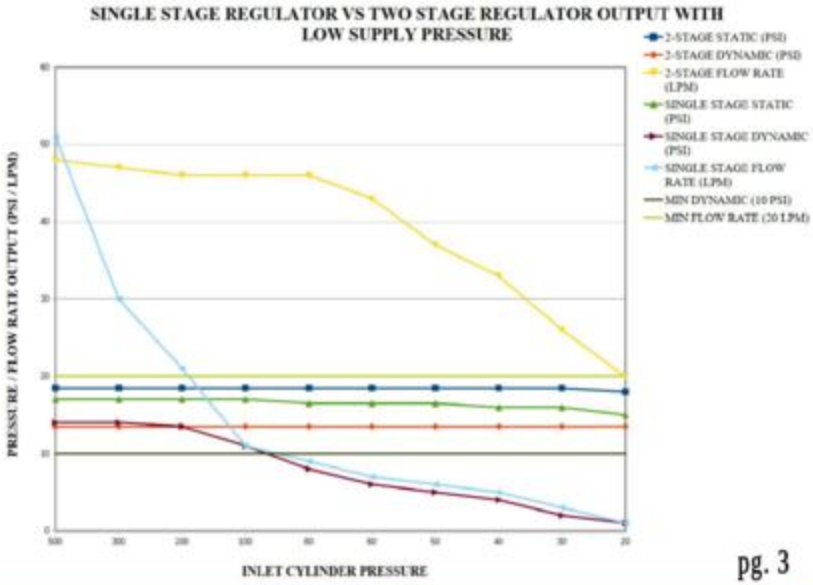
The RCV/RCR is equipped with a 2-stage main regulator that has one axial 1/8 BSPP outlet port. The regulator is calibrated to deliver oxygen at 15 psig. @ approx. 45 liters/minute. It is designed to be used with both the MH3/MH4 constant flow or MH EDS pulse-demand delivery equipment. All regulators will be calibrated to the 1 bar (15 psig.) standard unless otherwise specified by the buyer at time of order. (See 2-Stage Regulator SCD, pg. 22)

SECONDARY HIGH PESSURE/ HIGH FLOW REGULATOR:

The RCV/RCR can be specially ordered with a high-pressure, high-flow regulator that can accomodate (2) crew SCBA type Quick-Don masks. This unit can be calibrated to deliver up to 60-75 psig @ approx. 190 liters/min.

2-STAGE REGULATOR BENEFITS:

The benefits of using a 2-stage regulator are consistent output pressure and extended cylinder duration. The pressures and flow rates are virtually constant and within specifications for both delivery equipment all the way down to about 50 psig of cylinder pressure. This guarantees an additional 13%-23% duration from your O2 cylinder, based on the previous empty-low window of 300-500 psig when using single-stage regulators (see adjacent 2-stage regulator low tank pressure performance chart).



RCV/RCR Versions:

The RCV/RCR comes in three versions, and each version is distinguished by a suffix. Each version is identical in the way that it operates internally (inside the RCV main body), the difference lies in how the RCV is actuated and its specific behavior.

RCV:

The Remote Control Valve "main hex body" and internal components, without any attached peripherals. The RCV is the same for all versions and may be purchased as a stand-alone product.

RCV/RCR-2D (often shortened to RCV-2D):

The "-2D" suffix stands for 2nd generation, Dual acting. This RCV is operated electro-pneumatically. An electrical switch from the cockpit (master switch or separate on/off switch) sends an electrical signal to a manifold attached to the RCV, which has an internal PCB and electro-pneumatic Lee valves that control the flow of actuating gas from the pilot regulator to the main internal piston, which in turn moves the valve seat and opens/closes the valve. The manifold has a single LED that glows green when in the on (open) position, and turns off when in the off (closed) position. This RCV is non-latching, meaning that if power is disconnected, the RCV will default to the off (closed) position.

RCV/RCR-2DL (often shortened to RCV-2DL):

The "-2DL" suffix stands for 2nd generation, Dual acting, Latching. This RCV is also operated electro-pneumatically in the same way as the RCV-2D. An electrical switch from the cockpit (dual-pole dual-throw on/off switch separate from master switch required for use of the RCV-2DL) sends an electrical signal to a manifold attached to the RCV, which has an internal PCB and electro-pneumatic valves that control the flow of actuating gas from the pilot regulator to the main internal piston, which in turn moves the valve seat and opens/closes the valve. However unlike the RCV-2D, the manifold has a single LED that glows green when in the on (open) position, and red when in the off (closed) position (and off when power is disconnected). This RCV is latching, meaning that if power is removed, the pressurized gas remains in contact with the main internal piston and therefore the main valve seat remains in its current position (if the system was on when power was removed, the system will remain on, and vice-versa). This is due to the latching nature of the electro-pneumatic valves in the manifold, hence the "L" suffix.

RCV/RCR-2DP (often shortened to RCV-2DP):

The "-2DP" suffix stands for 2nd generation, Dual acting, Pneumatic. This RCV differs significantly from the RCV-2D and RCV-2DL in that it is operated purely pneumatically. The electrical D-connector mounted to the RCV body is solely for interfacing with the pressure transducer which reads tank pressure (referred to henceforth as the Pressure Sending Unit) and does not control RCV actuation. The RCV-2DP is actuated via a pneumatic switch in the cockpit. A pneumatic line runs from the pilot regulator to the cockpit switch, which carries the actuating pressure. The switch then toggles this pressure between the two pneumatic lines that run back to the RCV and into a pneumatic manifold mounted to the RCV cap.

CAUTION

Each RCV/RCR unit is fully tested for operation and specifications at 2,000 psig. @ 25 degrees C before they are packaged and released to the customer. If SAE-4 plugs or fill fittings are removed in the field, ensure they are torqued to their final values before use. (60 in-lbs typ. all SAE-4 fittings). With the exception of the HPRD; if this is removed, it must be replaced.

THE PORTS ON THE RCV ARE LABELED AS FOLLOWS (applies to all versions):

PRD (Non-resettable High Pressure Relief Device):

This is an emergency over-pressure burst plug, henceforth referred to as an HPRD. This port is a standard SAE-2F port compatable with the MH PRD Adapter (0RV01-0100-00). The HPRD will never need to be removed from the adapter for inspection or periodic replacement. It will, however, need to be replaced if it has been damaged, removed, or has popped open from an over-pressure situation. WARNING: DO NOT REMOVE OR COVER THE HPRD.

Tank Ports 1, 2, & 3 (always live!! connected directly to the cylinder/inlet port):

These are high pressure non-regulated and non-valved SAE-4 female ports. They pneumatically connect directly into the inlet port of the RCV unit at all times, which is usually connected to a cylinder. These are for connecting a refill fitting, pilot regulator, pressure sending unit, remote refill station, remote pressure gauge or manifold interconnecting all the above to the system or to another (cascade) cylinder system. These ports are SAE-4 7/16-20 UNF-2B straight female threads. Any SAE-4 male fitting must be used with a size 3-904 EPDM or silicone O-ring. Tank port #1 will have the pilot regulator mounted to it in its default layout. This regulator provides about 1 bar (15 psig) of pressure to operate the pneumatic actuator. It has a small flow-rate that is sufficient to operate the system in static modes and not suitable for operation in a constant-flow mode. It is also equipped with a resettable LPRD (Low Pressure Relief Device) in the event of the pilot regulator experiencing an over-pressure situation.

Valve Ports 1, 2 & 3 (on/off valved outlet ports):

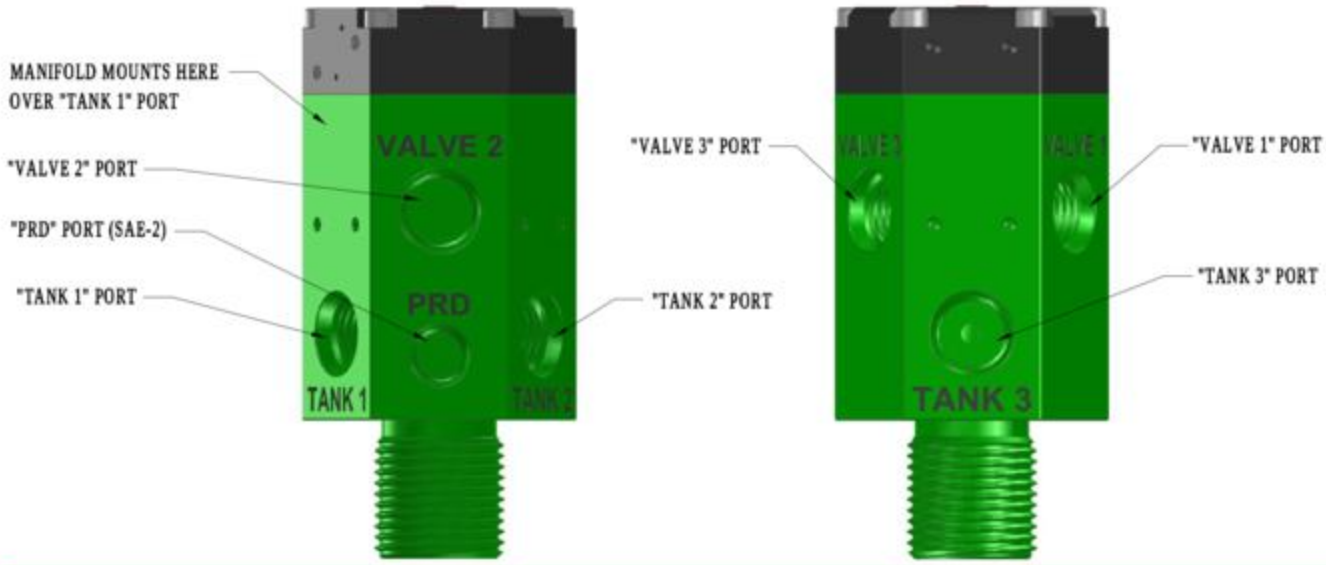
These are high pressure valved non-regulated ports. They are identical in form and function, but are switched on and off via the pneumatic, or electro-pneumatic system. Once the valve is open, they connect directly into the cylinder while the valve is in the on (open) state. These ports have SAE-4 7/16-20 UNF-2B straight female threads. Any SAE-4 male fitting must be used with a size 3-904 EPDM or silicone O-ring. The OFF setting is when the small red button on the top center of the RCV hex cap goes into the cap. The red button in the down position indicates that the valve piston is in its down position and presses the valve plunger into the inlet valve-seat, shutting off the oxygen supply from the cylinder to ports labeled valve 1, 2 & 3. The red button in the up position indicates that the valve piston is in its up position and allows the flow of oxygen directly from the cylinder to be present at the three (3) valve ports (See illustration on pg. 6). A pressure reducing regulator is not involved at this point.

Co-axial Inlet Port:

The inlet port is a dual threaded co-axial port. The male 3/4-16 UNF-2A (SAE-8) straight threads are for connecting directly to a cylinder of that same thread type. In addition, on the inside is a female 7/16-20 UNF-2B straight thread (SAE-4) port that is useful in applications where the RCV/RCR unit will not be directly mounted to the cylinder, but remotely mounted to a surface with an angle bracket. A fitting will connect the unit to the cylinder pneumatically. The male 3/4-16 UNF-2A (SAE-8) threads can then be used to secure the RCV unit to the bracket via a jam-nut (AN-924) or of that thread type (See Pages 9 & 11).

Application Hint:

The three "VALVE" ports are identical in form and function and differ only in physical position. They are to help satisfy multiple regulator requirements that may be calibrated at different pressures and/or flow. The ports can provide easy and safe applications where two separate non-interfering secondary systems may need to operate from one cylinder. Additionally, if a gauge or fill station is connected to a VALVE port, the system will need to be switched on for them to be active.



Item Packages:

ELECTRO-PNEUMATIC RCV/RCR-2D PACKAGE:

This basic package comes with the following items:

- RCV-2D assembly with an HPRD, HPRD SAE-2 Adapter, and electro-pneumatic valve interface manifold.
- 2-Stage main regulator with 6 mm poly tube one-touch fitting (other outlet fittings optional).
- 2-stage pilot regulator with pilot reg. tubing banjo fitting, & LPRD (resettable).
- Customer Interface Cable
- SAE-4M (7/16-20) port plugs, as needed depending on optional additional equipment.
- RCV/RCR-2DL Manual and test sheet insert.
- Interface hardware for cylinder or remote mount.

ELECTRO-PNEUMATIC RCV/RCR-2DL PACKAGE:

This basic package comes with the following items:

- RCV-2DL assembly with an HPRD, HPRD SAE-2 Adapter, and electro-pneumatic valve interface manifold.
- 2-Stage main regulator with 6 mm poly tube one-touch fitting (other outlet fittings optional).
- 2-stage pilot regulator with pilot reg. tubing banjo fitting, & LPRD (resettable).
- Customer Interface Cable
- SAE-4M (7/16-20) port plugs, as needed depending on optional additional equipment.
- RCV/RCR-2DL Manual and test sheet insert.
- Interface hardware for cylinder or remote mount.
- DPDT Switch

PNEUMATIC RCV/RCR-2DP PACKAGE:

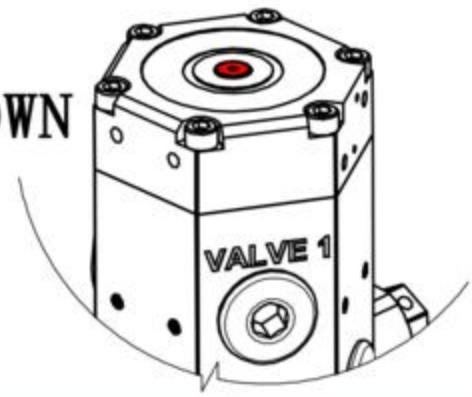
This basic package comes with the following items:

- RCV-2DP assembly with pneumatic interface manifold, DE-09M connector & connector mount, and an HPRD & HPRD SAE-2 Adapter.
- 2-Stage main regulator with 6 mm poly tube one-touch fitting (other outlet fittings optional).
- 2-stage pilot regulator with pilot reg. tubing banjo fitting, & LPRD (resettable).
- Pneumatic Switch & Tubing kit
- SAE-4M (7/16-20) port plugs, as needed depending on optional additional equipment.
- RCV/RCR-2DL Manual and test sheet insert.
- Interface hardware for cylinder or remote mount.

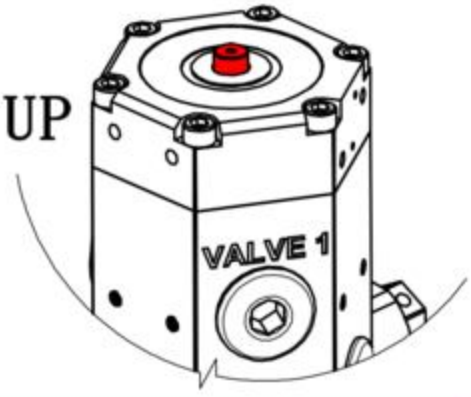
POP-UP VALVE INDICATOR:

There is a small red pop-up button on the top of the RCV that can be observed popping up or down as the valve is pneumatically opened or shut off. While the button is down, the "Valve" outlet ports are shut off. While the button is up, the "Valve" outlet ports are on.

DOWN



UP

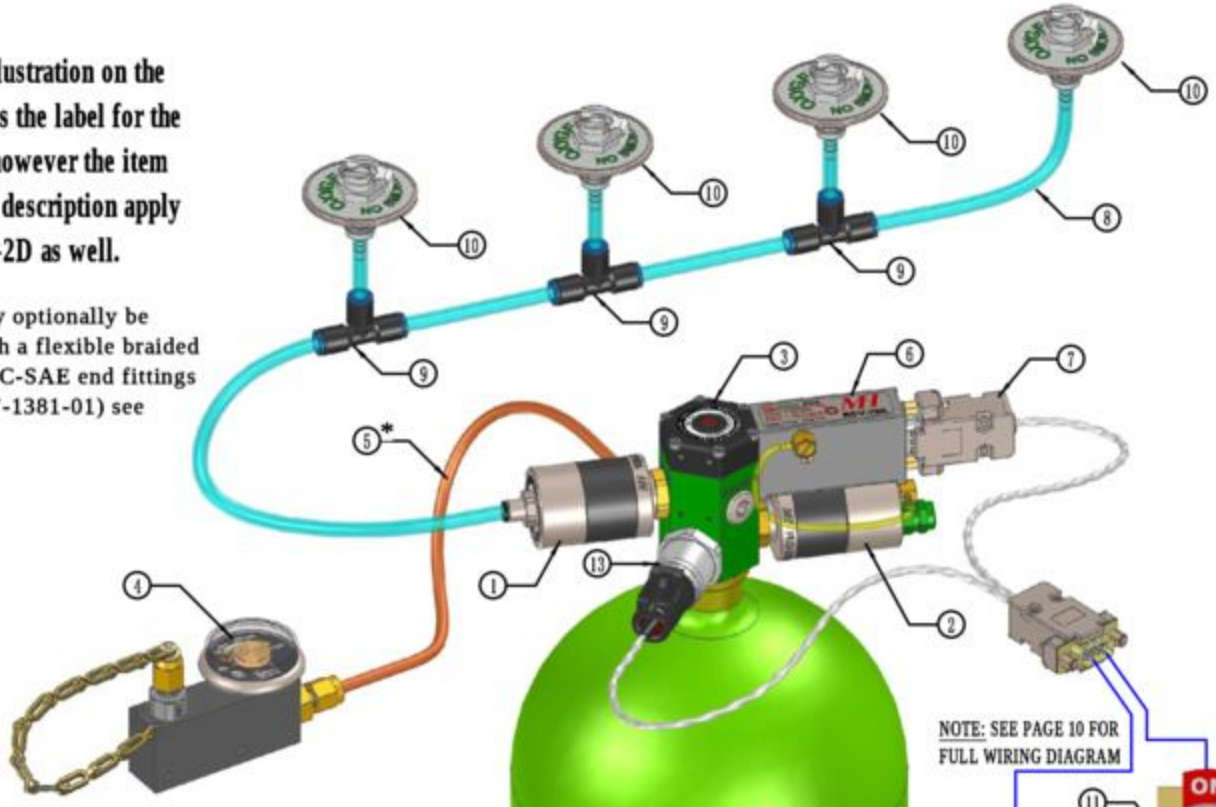


DETAILED REMOTE ELECTRO-PNEUMATIC ACTUATION DESCRIPTION (RCV-2D & RCV-2DL):

Remote electro-pneumatic method (abstract figure below) offers a convenient & reliable method of operation through electronic actuation. The Electro-pneumatic valves only draw power while the system is in transit, and therefore the RCV requires no power to maintain the system in the on or off state. This results in greatly reduced power consumption and increased reliability. The RCV-2D(L) can be operated on either supply voltage rating, 12V or 24V. Manifold actuating electrical power is controlled via a panel switch (11), or the aircraft main power (master) switch, sending 12 VDC or 24 VDC to the electro-pneumatic valves (located inside the electro-pneumatic manifold (6)). These electro-pneumatic valves control the flow of pressurized gas supplied by the pilot regulator (2) to operate the main internal pneumatic piston, which is linked to and actuates the main internal mechanical valve. The screw-on two-stage pilot regulator (2), calibrated at 1 bar (15 psig.), is required for use of the RCV and is directly plumbed to the actuating manifold. A small vent port releases a very small amount of gas as the electro-pneumatic valve transitions between the on and off states. At the users option, a small 4mm. OD X 2.4 mm. ID tube may be connected to this port to provide an overboard vent. The amount of gas released by this vent port (during turn-off phase only) is about 10 cc. for the interface manifold.

Note: The illustration on the right features the label for the RCV-2DL, however the item callouts and description apply to the RCV-2D as well.

* Item 5 may optionally be replaced with a flexible braided line & (2) JIC-SAE end fittings (p/n 00HDW-1381-01) see page 11.



RCV/RCR-2D & 2DL BASIC LAYOUT ITEMS	
REF	PART DESCRIPTION
1	MAIN REGULATOR (2-stage) (See 2-Stage Regulator SCD, pg. 22)
2	PILOT REGULATOR (2-stage)
3	RCV/RCR
4	DELUXE REFILL STATION (See Deluxe Refill Station SCD, pg. 32)
5	1/8" OD COPPER TUBING (See High Pressure Copper Tubing SCD, pg. 44-47)
6	RCV ELECTRO-PNEUMATIC INTERFACE MANIFOLD
7	REGULATOR INTERFACE CABLE
8	POLY TUBING, 6MM, BLUE (See Polyurethane Tubing SCD pg. 43)
9	6MM POLY TUBE T-UNION
10	BULKHEAD STYLE O_2 OUTLET WITH CHECK-VALVE (KIT)
11	ELECTRICAL PANEL SWITCH, CUSTOMER PROVIDED (OPTIONAL)
12	ELECTRICAL PANEL GAUGE (See Electric O_2 Gauge Datasheet pg. 30)
13	PRESSURE SENDING UNIT

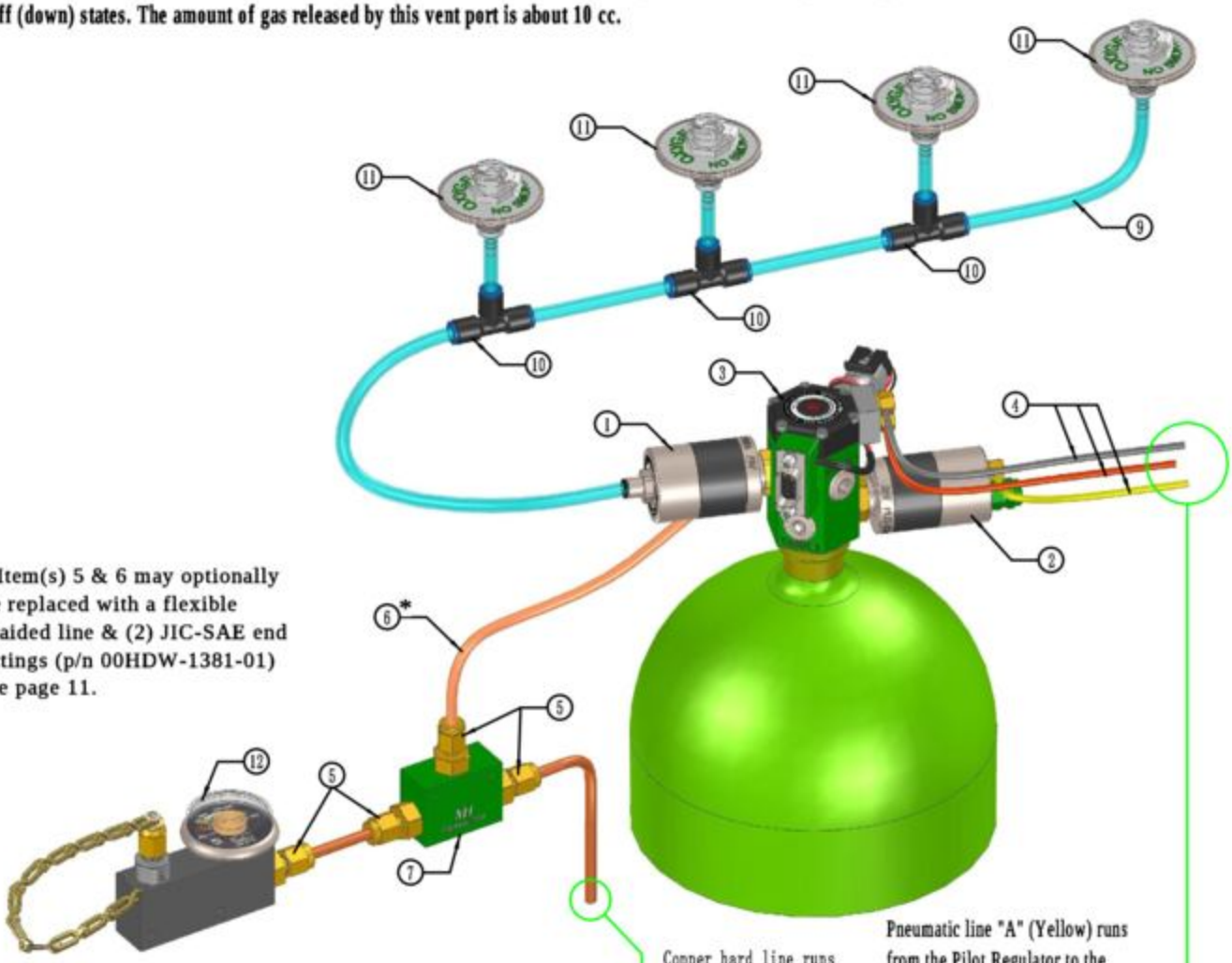
2.25" ELECTRICAL PANEL GAUGE

1.25" ELECTRICAL PANEL GAUGE (ALTERNATE OPTION)

NOTE: GAUGES NOT TO SCALE

DETAILED REMOTE PNEUMATIC ACTUATION DESCRIPTION (RCV-2DP):

The RCV-2DP is unique in that no electrical power is required for RCV actuation. A polyurethane pneumatic line which carries the actuating pressure runs from the pilot regulator to the cockpit switch. The switch then toggles this pressure between the two pneumatic lines that run back to the RCV and into a pneumatic manifold mounted to the RCV cap. The "A" port on the pilot regulator is always pressurized and is fitted with an internal orifice to control gas venting should a breakage occur. With the switch in the OFF position, ports "A" and "C" are connected and the valve is closed. When the system is switched ON, ports "A" and "B" are connected and the valve is opened. Once the RCV has settled in the on or off state, the pilot regulator automatically shuts off, holding the interface tubing at the calibrated pressure. A small vent port, on the valve (03), releases a very small amount of gas as the pneumatic valve transitions between the on (up) and off (down) states. The amount of gas released by this vent port is about 10 cc.

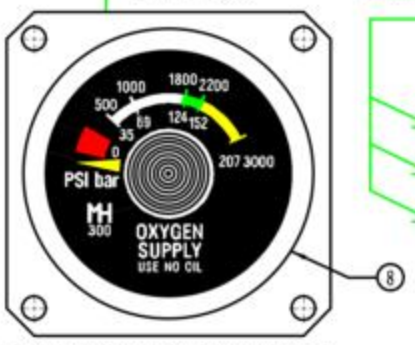


• Item(s) 5 & 6 may optionally be replaced with a flexible braided line & (2) JIC-SAE end fittings (p/n 00HDW-1381-01) see page 11.

RCV/RCR-2DP BASIC LAYOUT ITEMS	
REF	PART DESCRIPTION
1	MAIN REGULATOR, 2-STAGE (See 2-Stage Regulator SCD, pg. 22)
2	PILOT REGULATOR, 2-STAGE
3	RCV/RCR
4	PNEUMATIC SWITCH & TUBING (KIT) (See Pneumatic Valve Switch SCD, pg. 42)
5	SAE-4 TO 1/8" OD COMPRESSION TUBE FITTING (See Compress. Tube Fitting SCD pg. 46)
6	1/8" OD COPPER TUBING (See High Pressure Copper Tubing SCD, pg. 44-47)
7	4X4X4 SAE-4 HP TEE UNION MANIFOLD (See HP Tee Manifold SCD, pg. 36)
8	OXYGEN SUPPLY GAUGE w/ BEZEL & ADAPTER FITTING KIT (See Pneumatic Oxygen Gauge Panel Installation Insert pg. 27)
9	POLY TUBING, 6MM, BLUE (See Polyurethane Tubing SCD pg. 43)
10	6MM POLY TUBE T-UNION
11	BULKHEAD STYLE O_2 OUTLET (WITH CHECK-VALVE) KIT
12	DELUXE REFILL STATION (See Deluxe Refill Station SCD, pg. 32)

Copper hard line runs from the high pressure "Tee" manifold to a panel mounted pneumatic pressure gauge.

Pneumatic line "A" (Yellow) runs from the Pilot Regulator to the Pneumatic switch. Pneumatic lines "B" (Orange) & "C" (Grey) run from Pneumatic Switch to Pneumatic Manifold.

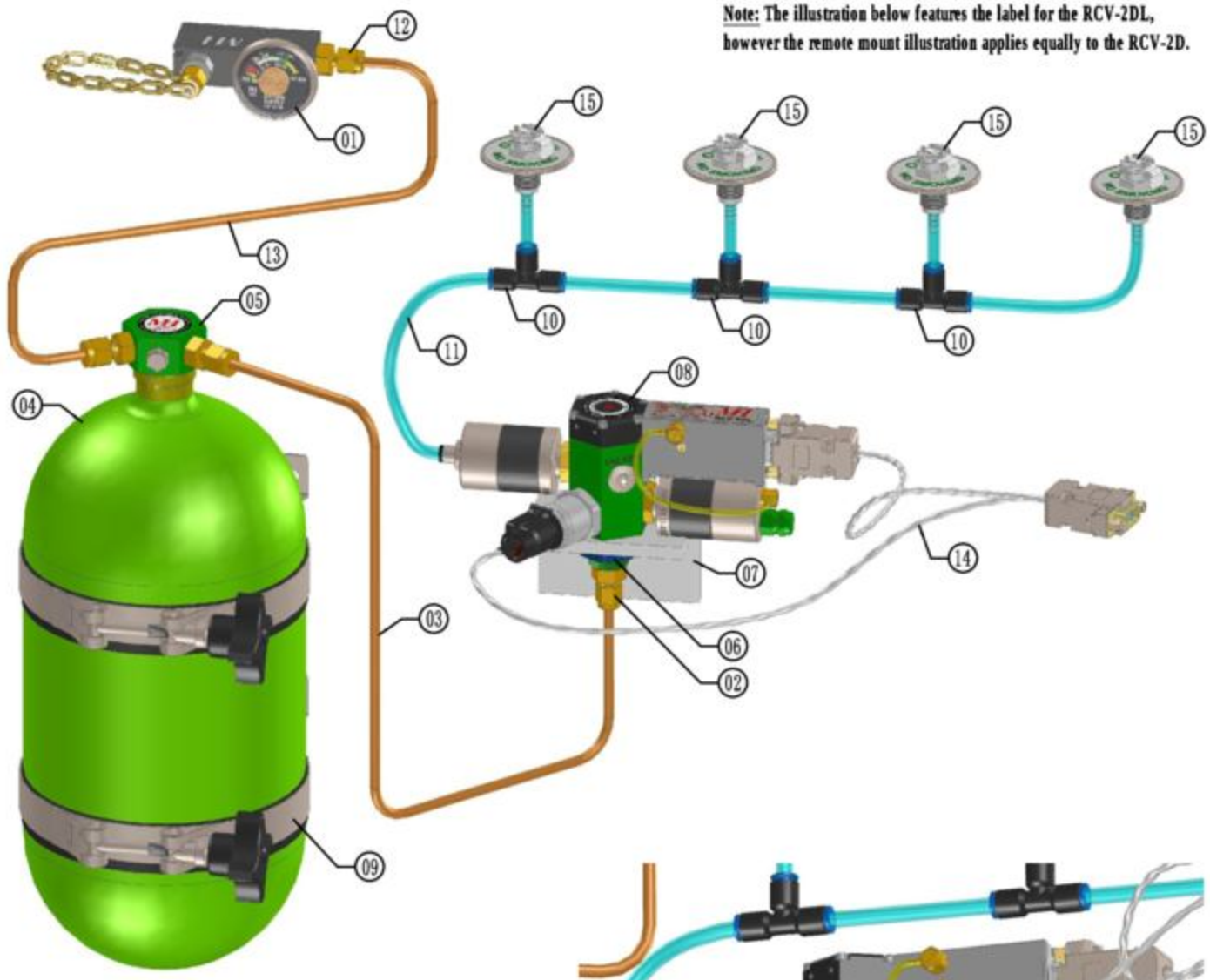


1.25" PNEUMATIC PANEL GAUGE

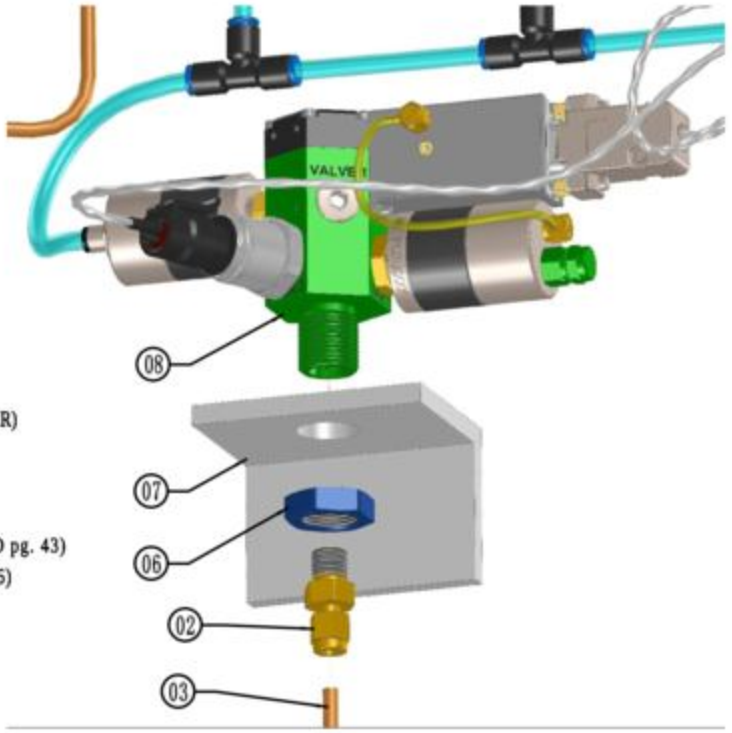
4-way Pneumatic Switch

RCV-2D & RCV-2DL REMOTE MOUNT OPTION:

Note: The illustration below features the label for the RCV-2DL, however the remote mount illustration applies equally to the RCV-2D.

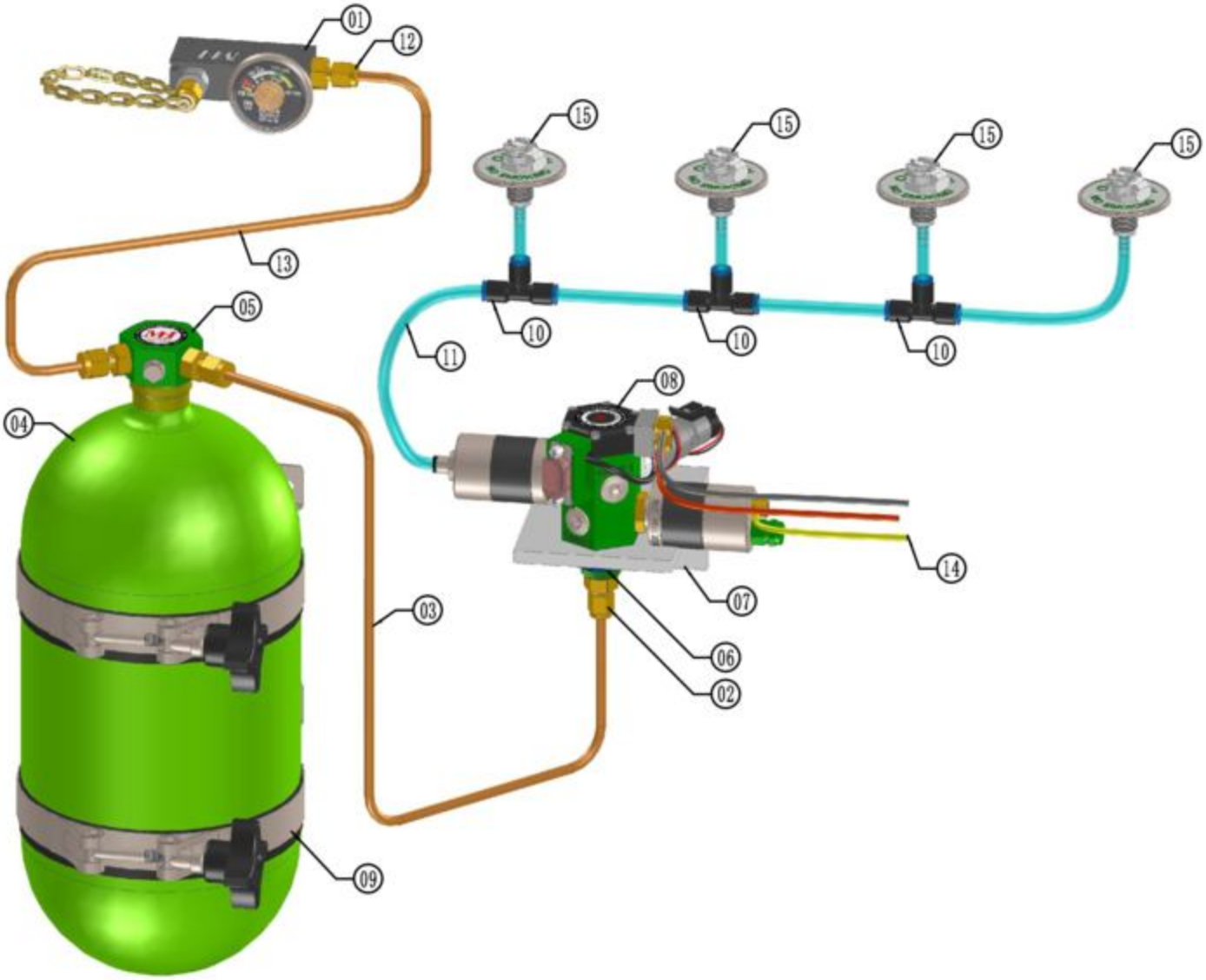


01 DELUXE REFILL STATION (See Deluxe Refill Station SCD, pg. 32)
02 SAE-4M x 3/16" TUBE ADAPTER, BRASS (OR OPTIONAL JIC-4 FITTING FOR BRAIDED FLEX LINE)(See Compress. Tube Fitting SCD pg. 46)
03 3/16" OD COPPER TUBING (OR OPTIONAL BRAIDED LINE) (See High Pressure Copper Tubing SCD, pg. 44-47)
04 CYLINDER (ALUMINUM & COMPOSITE AVAILABLE)
05 LPM-75 HIGH-PRESSURE MANIFOLD
06 REMOTE MOUNT NUT AN924-8D, 3/4-16, BLUE
07 RCV/RCR MOUNTING BRACKET NOT PROVIDED (FABRICATED BY CUSTOMER)
08 RCV/RCR REGULATOR ASSEMBLY
09 CYLINDER MOUNTING KIT (See CMK Chart, pg. 37)
10 T & Y UNION KIT, 6MM SMC (T SHOWN)
11 6MM POLY TUBE W/ TRACK KIT (30' PROVIDED) (See Polyurethane Tubing SCD pg. 43)
12 SAE-4M x 1/8" TUBE ADAPTER, BRASS (See Compress. Tube Fitting SCD pg. 46)
13 1/8" OD COPPER TUBING (See High Pressure Copper Tubing SCD, pg. 44-47)
14 RCV/RCR REGULATOR CABLE ASSEMBLY
15 BULKHEAD STYLE O2 OUTLET WITH CHECK VALVE (KIT)



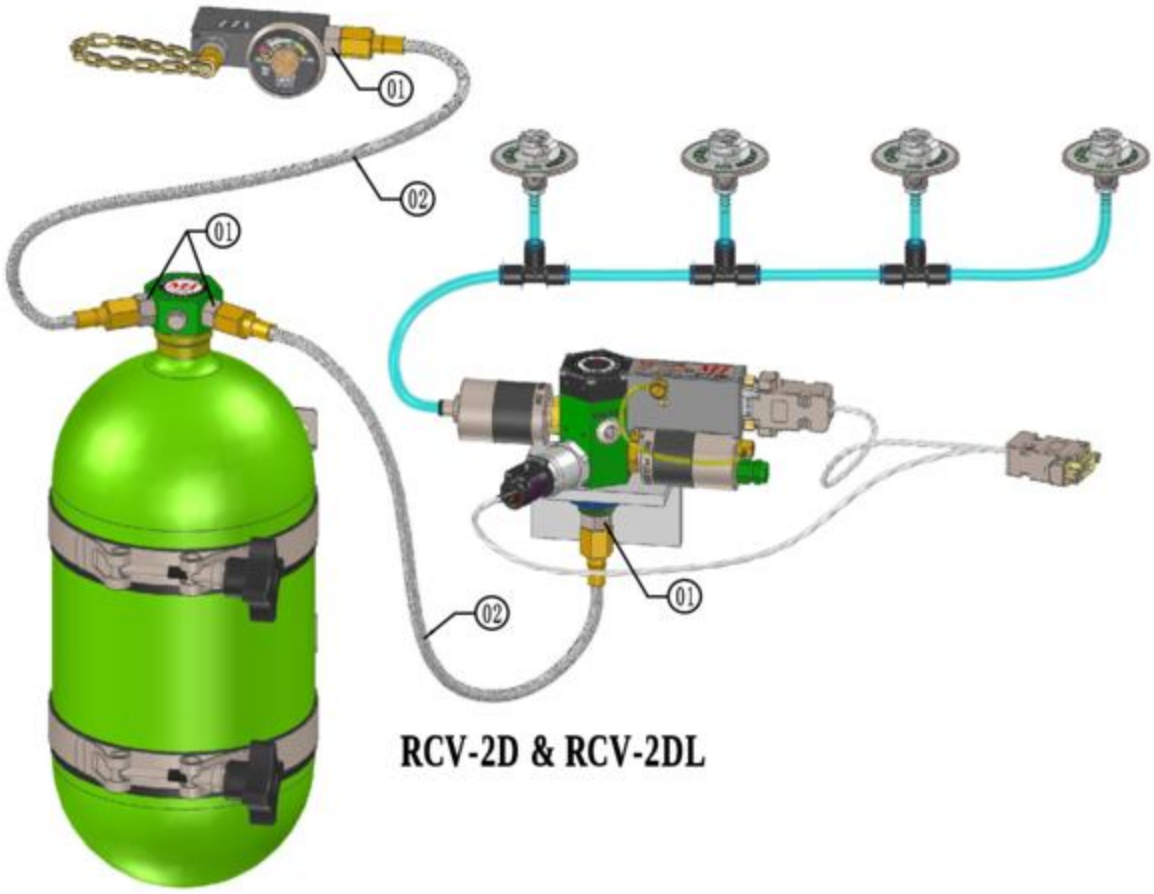
REMOTE MOUNT ASSEMBLY DETAIL
(also applies to RCV-2DP)

RCV-2DP REMOTE MOUNT OPTION:

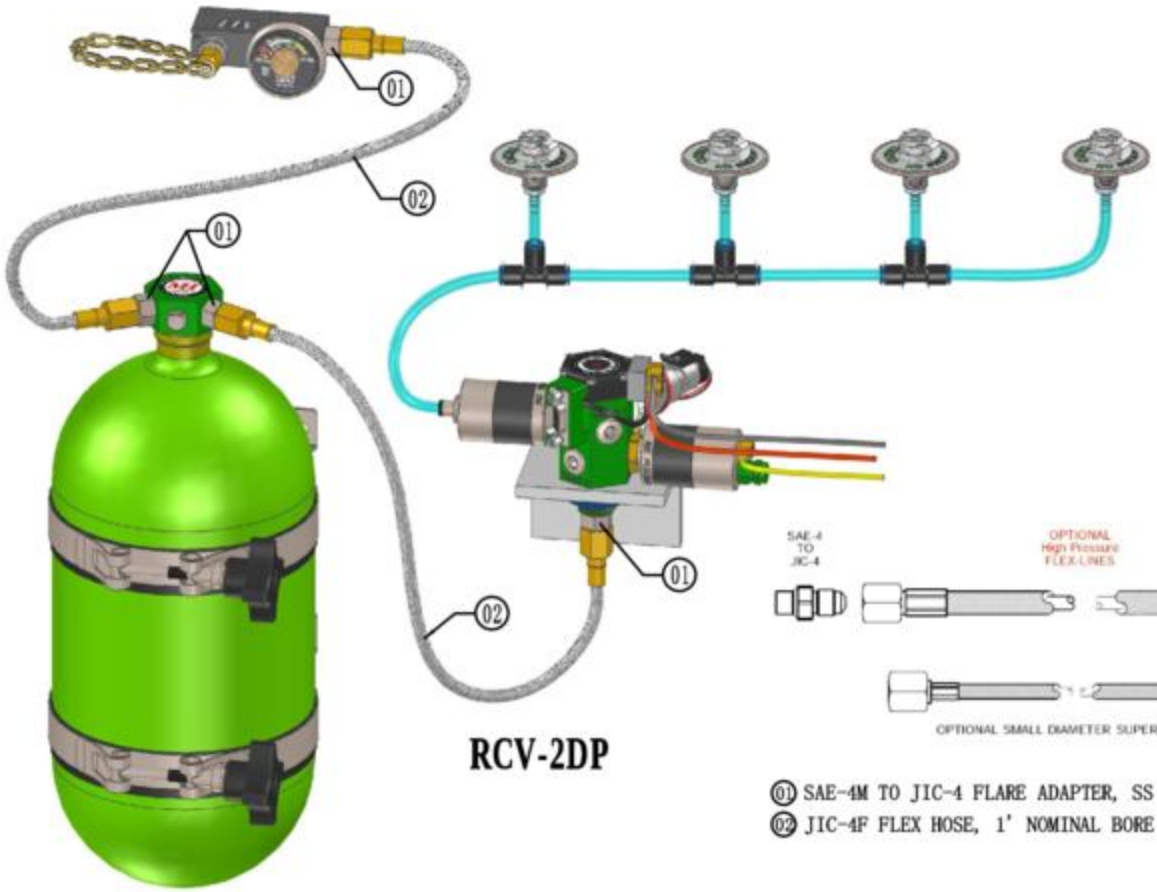


01 DELUXE REFILL STATION (See Deluxe Refill Station SCD, pg. 32)
02 SAE-4M x 3/16" TUBE ADAPTER, BRASS (OR OPTIONAL JIC-4 FITTING FOR BRAIDED FLEX LINE) (See Compress. Tube Fitting SCD pg. 46)
03 3/16" OD COPPER TUBING (OR OPTIONAL BRAIDED LINE) (See High Pressure Copper Tubing SCD, pg. 44-47)
04 CYLINDER (ALUMINUM & COMPOSITE AVAILABLE)
05 LPM-75 HIGH-PRESSURE MANIFOLD (Note: Pneumatic gauge may be interfaced with the remaining port on this manifold)
06 REMOTE MOUNT NUT AN924-8D, 3/4-16, BLUE
07 RCV/RCR MOUNTING BRACKET NOT PROVIDED (FABRICATED BY CUSTOMER)
08 RCV/RCR REGULATOR ASSEMBLY
09 CYLINDER MOUNTING KIT (See CMK Chart, pg. 37)
10 T & Y UNION KIT, 6MM SMC (T SHOWN)
11 6MM POLY TUBE W/ TRACK KIT (30' PROVIDED) (See Polyurethane Tubing SCD pg. 43)
12 SAE-4M x 1/8" TUBE ADAPTER, BRASS (See Compress. Tube Fitting SCD pg. 46)
13 1/8" OD COPPER TUBING (See High Pressure Copper Tubing SCD, pg. 44-47)
14 PNEUMATIC SWITCH & TUBING KIT (See Pneumatic Valve Switch SCD, pg. 40)
15 BULKHEAD STYLE O2 OUTLET WITH CHECK VALVE (KIT)

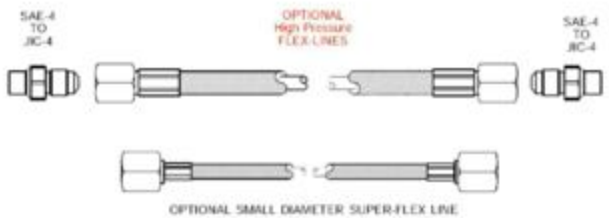
ALTERNATE RCV-2D(L,P) REMOTE MOUNT OPTION (BRAIDED FLEX LINE):



RCV-2D & RCV-2DL

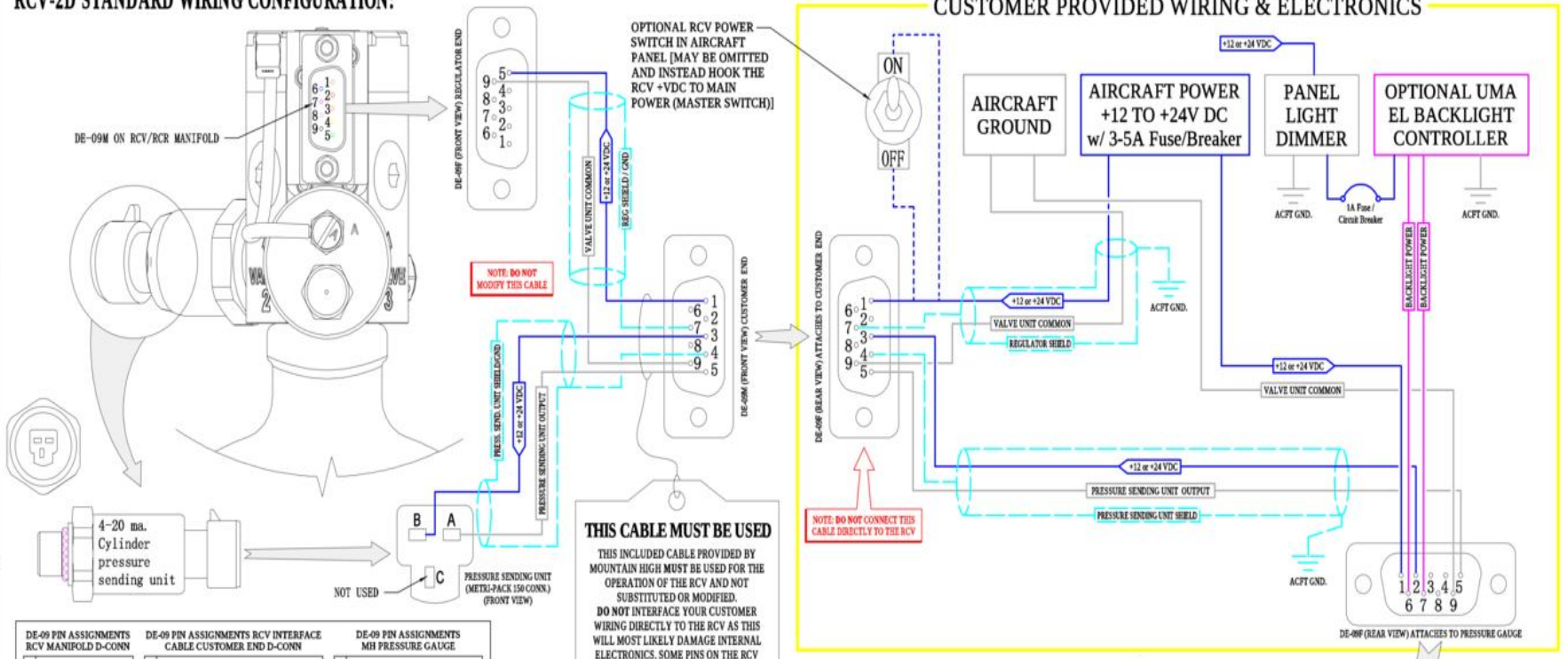


RCV-2DP



(01) SAE-4M TO JIC-4 FLARE ADAPTER, SS (00HDW-1381-01)
(02) JIC-4F FLEX HOSE, 1' NOMINAL BORE (00HDW-0013-01)

RCV-2D STANDARD WIRING CONFIGURATION:



THIS CABLE MUST BE USED

THIS INCLUDED CABLE PROVIDED BY MOUNTAIN HIGH **MUST** BE USED FOR THE OPERATION OF THE RCV AND NOT SUBSTITUTED OR MODIFIED.
DO NOT INTERFACE YOUR CUSTOMER WIRING DIRECTLY TO THE RCV AS THIS WILL MOST LIKELY DAMAGE INTERNAL ELECTRONICS. SOME PINS ON THE RCV DE-09 CONNECTOR ARE USED FOR INTERNAL PRODUCTION TESTING / DIAGNOSTICS.

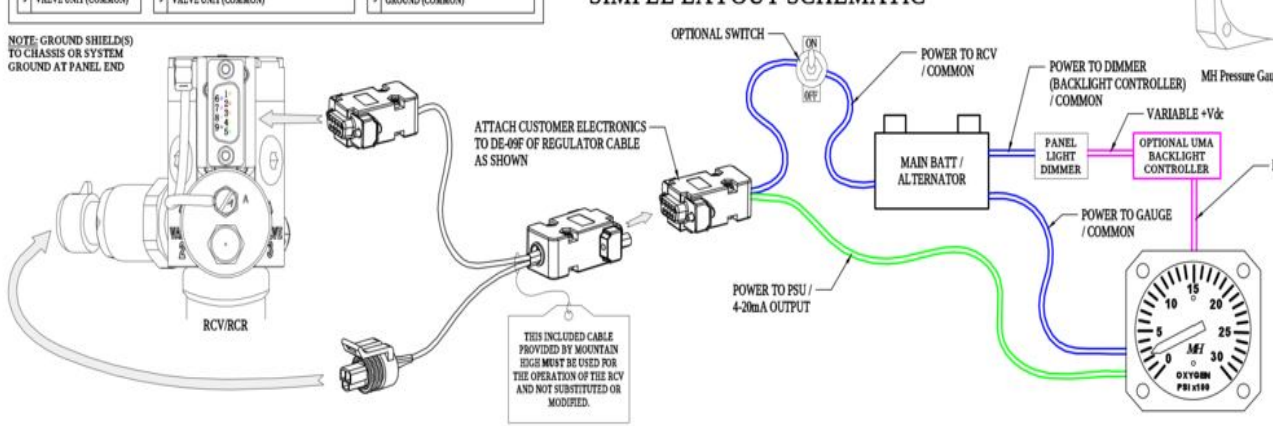
DE-09 PIN ASSIGNMENTS RCV MANIFOLD D-CONN	
1	N/C
2	N/C
3	N/C
4	N/C
5	VALVE UNIT (+Vdc)
6	N/C
7	N/C
8	N/C
9	VALVE UNIT (COMMON)

DE-09 PIN ASSIGNMENTS RCV INTERFACE CABLE CUSTOMER END D-CONN	
1	VALVE UNIT (+Vdc)
2	N/C
3	+12 TO +24 Vdc (TO PRESSURE SENDING UNIT)
4	PRESSURE SENDING UNIT SHIELD GROUND
5	PRESSURE (TANK) SENDING UNIT OUTPUT
6	N/C
7	VALVE UNIT SHIELD GROUND
8	N/C
9	VALVE UNIT (COMMON)

DE-09 PIN ASSIGNMENTS MH PRESSURE GAUGE	
1	+12 to +24Vdc
2	INTERNALLY CONNECTED TO PIN 1
3	N/C (LEGACY USE NOW OBSOLETE)
4	N/C
5	PRESSURE SENDING UNIT OUTPUT
6	+V (AC) BACKLIGHT POWER
7	+V (AC) BACKLIGHT POWER
8	INTERNALLY CONNECTED TO PIN 9
9	GROUND (COMMON)

NOTE: GROUND SHIELD(S) TO CHASSIS OR SYSTEM GROUND AT PANEL END

SIMPLE LAYOUT SCHEMATIC



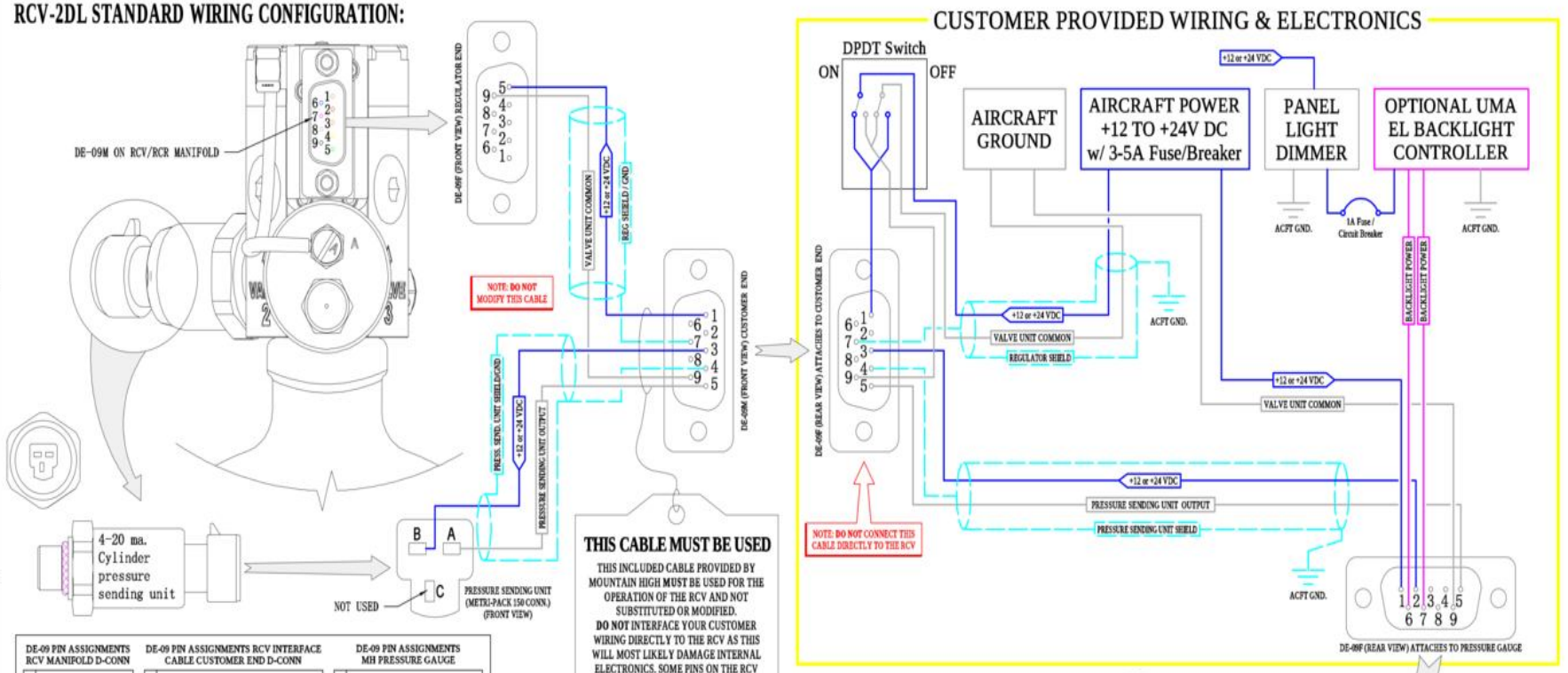
REVISION HISTORY			
REV	ECO NO. YYYY-## ##	NAME	NOTES
–	2024-083 2024-10-08	KQM	INITIAL RELEASE
-1	2026-006 2026-02-18	KQM	RCV-2D version only

THIRD ANGLE PROJECTION
DO NOT SCALE DRAWING

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

DRAWN	KQM 2024-10-08	DOC TITLE	RCV-2D Standard Wiring Configuration & Schematic		
CHECKED	EAM 2024-11-11	DOC NUMBER	5RCVR-081-000	DWG REV.	-1
ENG APPR.	JB 2024-10-11	SRCFILE	5RCVR-081-000$-1	INV. PART NUMBER	N/A
APPROVED	HHS 2024-10-11	DWG FORMAT:	ESR-002 Rev H [27]	DWG SCALE	NTS
				DWG SHEET	1 OF 1
				MODEL:	RCV-2D
				DWG SIZE	B 17x11

RCV-2DL STANDARD WIRING CONFIGURATION:



THIS CABLE MUST BE USED

THIS INCLUDED CABLE PROVIDED BY MOUNTAIN HIGH **MUST** BE USED FOR THE OPERATION OF THE RCV AND NOT SUBSTITUTED OR MODIFIED.
DO NOT INTERFACE YOUR CUSTOMER WIRING DIRECTLY TO THE RCV AS THIS WILL MOST LIKELY DAMAGE INTERNAL ELECTRONICS. SOME PINS ON THE RCV DE-09 CONNECTOR ARE USED FOR INTERNAL PRODUCTION TESTING / DIAGNOSTICS.

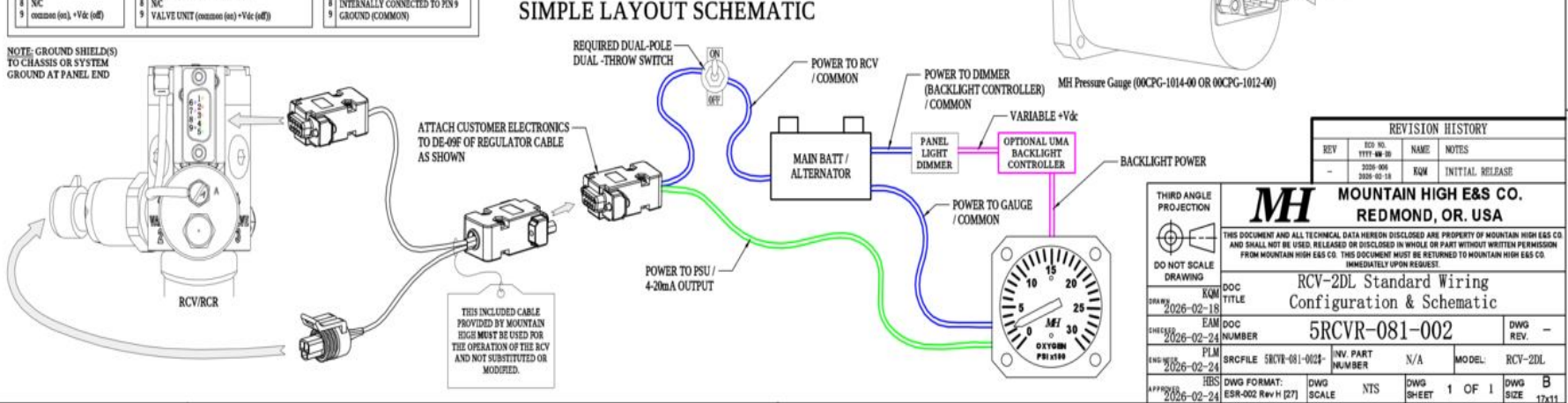
DE-09 PIN ASSIGNMENTS RCV MANIFOLD D-CONN	
1	N/C
2	N/C
3	N/C
4	N/C
5	+Vdc (on), common (off)
6	N/C
7	N/C
8	N/C
9	common (on), +Vdc (off)

DE-09 PIN ASSIGNMENTS RCV INTERFACE CABLE CUSTOMER END D-CONN	
1	VALVE UNIT (+Vdc (on), common (off))
2	N/C
3	+12 TO +24 Vdc (TO PRESSURE SENDING UNIT)
4	PRESSURE SENDING UNIT SHIELD GROUND
5	PRESSURE (TANK) SENDING UNIT OUTPUT
6	N/C
7	VALVE UNIT SHIELD GROUND
8	N/C
9	VALVE UNIT (common (on) +Vdc (off))

DE-09 PIN ASSIGNMENTS MH PRESSURE GAUGE	
1	+12 to +24Vdc
2	INTERNALLY CONNECTED TO PIN 1
3	N/C (LEGACY USE NOW OBSOLETE)
4	N/C
5	PRESSURE SENDING UNIT OUTPUT
6	+V (AC) BACKLIGHT POWER
7	+V (AC) BACKLIGHT POWER
8	INTERNALLY CONNECTED TO PIN 9
9	GROUND (COMMON)

NOTE: GROUND SHIELD(S) TO CHASSIS OR SYSTEM GROUND AT PANEL END

SIMPLE LAYOUT SCHEMATIC

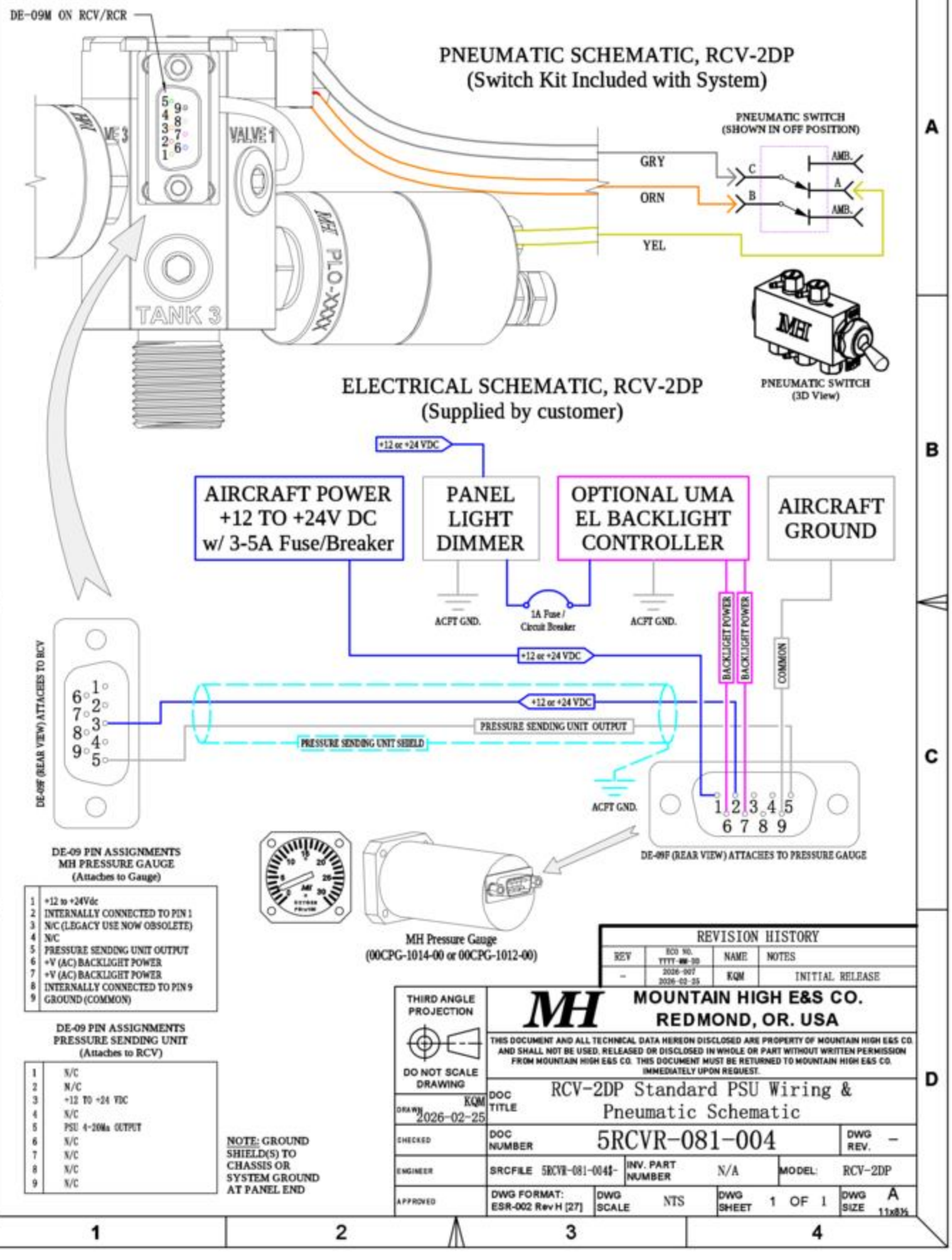


REVISION HISTORY				
REV	ECO NO. YYYY-##-##	NAME	NOTES	
-	2026-006 2026-02-18	KQM	INITIAL RELEASE	

THIRD ANGLE PROJECTION
DO NOT SCALE DRAWING

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

DRAWN	KQM 2026-02-18	DOC TITLE	RCV-2DL Standard Wiring Configuration & Schematic		
CHECKED	EAM 2026-02-24	DOC NUMBER	5RCVR-081-002	DWG REV.	-
ENG APPR.	PLM 2026-02-24	SRCFILE	5RCVR-081-002	INV. PART NUMBER	N/A
APPROVED	HHS 2026-02-24	DWG FORMAT:	ESR-002 Rev H [27]	DWG SCALE	NTS
		MODEL:	RCV-2DL	DWG SHEET	1 OF 1
				DWG SIZE	B 17x11



DE-09 PIN ASSIGNMENTS
MH PRESSURE GAUGE
(Attaches to Gauge)

1	+12 to +24Vdc
2	INTERNALLY CONNECTED TO PIN 1
3	N/C (LEGACY USE NOW OBSOLETE)
4	N/C
5	PRESSURE SENDING UNIT OUTPUT
6	+V (AC) BACKLIGHT POWER
7	+V (AC) BACKLIGHT POWER
8	INTERNALLY CONNECTED TO PIN 9
9	GROUND (COMMON)

DE-09 PIN ASSIGNMENTS
PRESSURE SENDING UNIT
(Attaches to RCV)

1	N/C
2	N/C
3	+12 TO +24 VDC
4	N/C
5	PSU 4-20Ma OUTPUT
6	N/C
7	N/C
8	N/C
9	N/C

NOTE: GROUND SHIELD(S) TO CHASSIS OR SYSTEM GROUND AT PANEL END

REVISION HISTORY

REV	ECO NO. YYYY-###-##	NAME	NOTES
–	2026-007 2026-02-25	KQM	INITIAL RELEASE

THIRD ANGLE PROJECTION

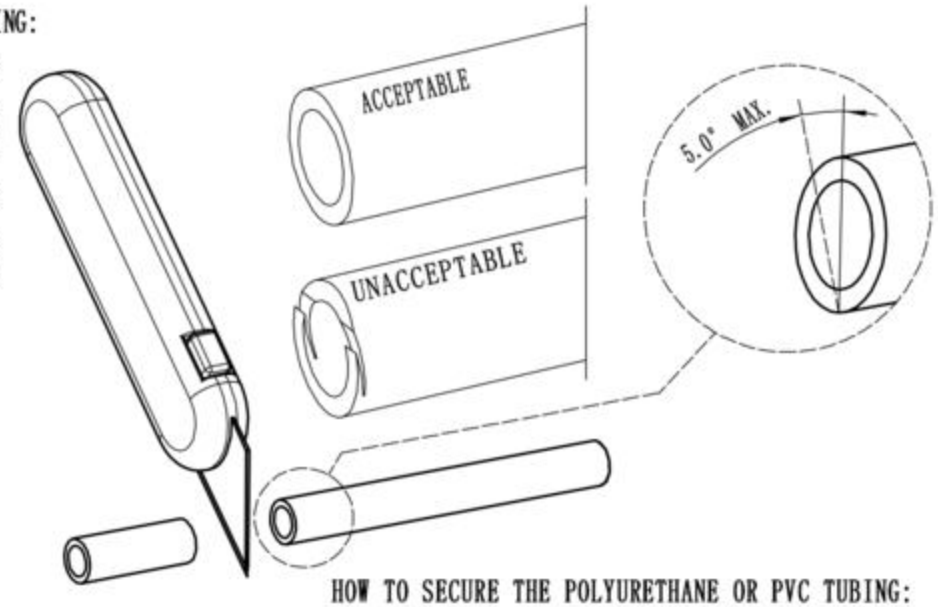
DO NOT SCALE DRAWING

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

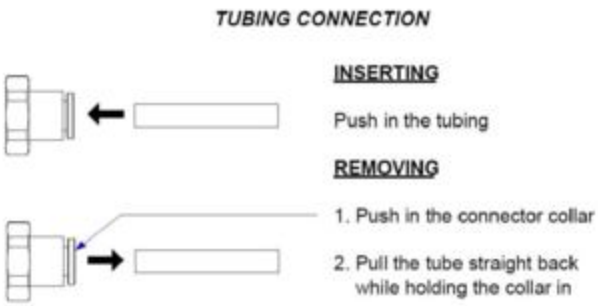
DRAWN	KQM 2026-02-25	DOC TITLE	RCV-2DP Standard PSU Wiring & Pneumatic Schematic		
CHECKED		DOC NUMBER	5RCVR-081-004	DWG REV.	–
ENGINEER		SRCFILE	5RCVR-081-004$-	INV. PART NUMBER	N/A
APPROVED		DWG FORMAT:	ESR-002 Rev H [27]	DWG SCALE	NTS
		DWG SHEET	1 OF 1	DWG SIZE	A 11x8½

HOW TO CUT POLYURETHANE OR PVC TUBING:

Use a razor to cut the tubing at the desired location. If multiple cuts are required, ensure that no 'tags' are left behind from the previous cut (see "Unacceptable"). Make the cut as perpendicular to the tube as possible (within ±5°).



HOW TO USE THE ONE TOUCH FITTING:



To INSERT TUBING: push the tubing into the connector until resistance is felt, **then push a little further, about 1/8 inch [3 mm].** Gently tug on the tubing to make sure it is captured.

To REMOVE TUBING: push the tubing in slightly, then push in the connector collar while pulling gently on the tubing.

When removing tubing, ***DO NOT pull on the tubing without pushing in the collar,*** as this will likely damage the connector.

HOW TO CUT COPPER TUBING:

See drawing 5SHDW-0100-00 on pages 44-47 for instructions for cutting, purging, and installing copper hard lines.

WHAT DIAMETER COPPER TUBE SHOULD I USE FOR MY INSTALLATION?

It depends on how it is used within the system. 1/8" copper line should be used for connecting a remote fill station. 3/16" copper line should be used for cascading multiple cylinders or connecting a cylinder to a remotely mounted RCV.

HOW TO SECURE THE POLYURETHANE OR PVC TUBING:

Mountain High Oxygen provides tubing track kits for securing 4mm & 6mm tubing for built-in systems. See MHOxygen.com for more information.

6mm Track

4mm Track

HOW TO CHECK FOR LEAKS:

See Section 4 "Troubleshooting"

VIDEO TUTORIALS:

How to Fill Your Own Oxygen Cylinder

How to Fill a Built-in Oxygen System Using Transfill Adapters

When to Refill Your Oxygen Cylinder

SECTION 3: OPERATING INSTRUCTIONS

PRE-FLIGHT SYSTEM TEST:

- If the RCV/RCR is being used in conjunction with a manual tank valve, ensure the valve is in the fully open position.

Manual Pneumatic version:

- Cycle the pneumatic RCV ON/OFF switch and verify that the red pop-up valve indicator on top of the RCV moves up and down to match the position of the pneumatic switch (if the RCV is visible).

Electro-Pneumatic version:

- Turn the master switch ON
- Turn the RCV power switch ON (if used)
- For the RCV-2DL, cycle the RCV power switch and verify that the red pop-up valve indicator on top of the RCV moves up and down to match the position of the electrical RCV power switch (if the RCV is visible).
- For the RCV-2D, cycle the Master switch (or RCV power switch if used) and verify that the red pop-up valve indicator on top of the RCV moves up and down to match the position of the electrical RCV power switch (if the RCV is visible).

If used with a constant flow system:

- Ensure that the flow indicator ball on your Flowmeter, when held vertically, indicates that oxygen is flowing when the pneumatic switch or RCV power/Master switch is in the ON position. Then turn the pneumatic switch or RCV power/Master switch OFF and observe the indicator ball of the flowmeter. The ball should gradually return to the zero indication.

If used with an EDS electronic oxygen delivery system:

- With the pneumatic switch or RCV power/Master switch in the OFF position, turn the EDS system to "N" (normal) mode, don the cannula or facemask (see "How to Don A Cannula" video (QR code on this page)), and attempt to breathe. The EDS should give a flow fault alarm. Then turn the pneumatic switch or RCV power/Master switch ON and attempt to breathe. The EDS flow fault alarm should stop and you should feel a pulse of oxygen, as well as observe the LED indicator on the EDS flash once per pulse. Turn the pneumatic switch or RCV power/Master switch and EDS back to OFF until ready to use.

IN-FLIGHT USE:

How To Don A Cannula

- Turn the pneumatic or Electric RCV ON/OFF switch ON.
- Don the cannula or facemask (see "How to Don A Cannula" video).

If used with a constant flow system:

- Hold the Flowmeter vertical and use the adjustment wheel to move the indicator ball to your current altitude (or greater if more oxygen is desired). The Flowmeter should be re-adjusted when altitude changes.

Alternatively, you may adjust the Flowmeter to your highest expected crusing altitude at the beginning of the flight. This would allow you to fly without adjusting for altitude changes, however more oxygen will be used than necessary. Once adjusted, the flowmeter can be laid in any orientation and will continue to flow at the set rate.

If used with an EDS electronic oxygen delivery system:

- With the RCV On/OFF switch in the ON position, turn the EDS system to the desired setting.

"N" (normal) mode will provide immediate oxygen delivery.

"D5" & "D10" will delay oxygen delivery until 5,000 or 10,000 feet (pressure altitude) respectively. This setting enables you to set the EDS to the altitude you want oxygen delivered at the beginning of the flight, without unecessary oxygen delivery at lower altitudes.

"F1 - F4" facemask settings should be used with a facemask when in the flight levels (or anytime a mask is used), or alternatively when the user desires a larger amount of oxygen with each pulse (see the EDS manual for comprehensive use instructions).

If the EDS gives a flow fault alarm, double check that the RCV ON/OFF switch is in the ON position and there are no kinks in the polyurethane feed tube from the RDV/RCR to the EDS (see Section 4 "Troubleshooting").

POST-FLIGHT SHUTDOWN:

- Remove the cannula or mask.
- Turn the pneumatic switch OFF.
- If using an EDS electronic oxygen delivery system, turn the system off.

SECTION 4: TROUBLESHOOTING GUIDE

TROUBLESHOOTING LEAKS:

Use Snoop leak detector (00VEN-0070-00) or a non-petroleum based soap (Dawn) and water solution to check for leaks.

- Check copper tubing/brass compression fitting connections. If there is a leak, see pages 45-47 (5SHDW-0100-00, sheets 2-4) for assembly, re-assembly, & ferrule replacements.

- If using the RCV-2DP, Check the switch banjo fittings. Apply leak detector to top, bottom, and barb of the banjo fitting on both the switch and the RCV Manifold. If there is a leak, ensure the fitting O-rings are clean and undamaged. If the barb has been damaged during tubing removal, the fitting may need to be replaced. See pages 40-41 (5SBNJ-002-100, sheets 1-2) for details.

- Check outlet ports using a test gauge or leak detector, verify no oxygen is flowing with the port check valve closed (fitting not clicked into port). If there is a leak, the CPC port may need to be replaced (p/n 00CPC-0018-00).

- Check the remote fill station. Using a test gauge or leak detector, verify no oxygen is flowing out of the fill port. If there is a leak, send the fill station in for repair. If it is a deluxe fill station, apply leak detector to gauge threads. If there is a leak, re-apply teflon tape. See pages 25-26 (5SCPG-1010-00 & 5SCPG-1011-00) for details.

OPERATION TROUBLESHOOTING:

If the RCV is not operating properly or does not turn on, use the following guidelines:

Manual Pneumatic version:

- Verify the tank has pressure.

- Verify the switch fitting tubing is correct. See page 16 for connections.

- Verify the switch fittings are tight and not leaking.

- Verify the switch is oriented properly. See page 8 & 16 for switch orientation.

- Observe the pop-up valve indicator to verify operating conditions as shown on page 6.

- Verify that the 6mm outlet tubing is properly seated/installed in their respective fittings and unions.

Electro-Pneumatic version:

If the LED turns On/Off with the RCV power switch:

- Verify the tank has pressure.

- Observe the pop-up valve indicator to verify operating conditions as shown on page 6.

- Verify that the 6mm outlet tubing is properly seated/installed in their respective fittings and unions.

- Verify the 1/8" polyurethane tubing between the pilot regulator and RCV manifold is connected/secure and there are no leaks.

- To check if the issue is the RCV or Pilot Regulator: Slowly loosen the Banjo fitting on the RCV manifold while listening for the hiss of oxygen flow. If you hear oxygen flowing steadly, re-tighten the Banjo fitting, the issue is not the pilot regulator. Send the RCV in for servicing. If no oxygen is flowing even after the banjo fitting is fully removed, the issue most likely lies with the pilot regulator. Send the regulator in for servicing.

If the LED does not turn On/Off with the RCV power switch:

- Verify the fuse/circuit breaker(s) are in-tact/ closed.

- Check battery & master, ensure other aircraft systems are recieving power.

- Verify the RCV power switch is ON.

- Check electrical wiring with the Standard Wiring Configuration & Schematics on pg. 12-15, ensure DE-09 connectors are secure, there are no chafed/frayed wires, no signs of thermal damage (discoloration, burning wire smell), and system is properly grounded.

- Ensure the RCV Regulator Cable is not reversed.

SECTION 5: OPTIONAL EQUIPMENT & PERIPHERAL SYSTEM COMPONENTS

The following drawings detail the various peripheral components that may be included in a built-in RCV/RCR oxygen system.

Schedule Of Drawings			
Drawing #	Part #	Page #	Description
5IREG-1096-0x	00REG-1096-0x	22	2-Stage Axial Regulator, SAE-4M x Tube Outlet, SCD
5ICPG-1005-01	41000-0030-01	23	4-20mA, 0-3000 PSIG Transducer
5ICPG-0030-01	41002-0030-01	24	1-5Vdc, 0-3000 PSIG Transducer
5SCPG-1010-00	00CPG-1010-00	25	MH-300 Pressure Gauge, SCD
5SCPG-1011-00	00CPG-1011-00	26	MH-400 Pressure Gauge, SCD
5ICPG-0030-00	00CPG-0030-00	27	MH-300 Gauge Plate & Installation, SCD
5IEG6-0051-01	00BLT-107x-00	28	1.5″ Electronic O_2 Gauge Form Factor
5IEG6-0051-02	00BLT-107x-00	29	2.25″ Electronic O_2 Gauge Form Factor
5IEG6-0051-04	00BLT-107x-00	30	Electronic O_2 Gauges Data Sheet
5IBLT-1010-00	00BLT-1010-00	31	Check Valve Assy, SAE-4M x AN-800 w/ Cap & Chain
5IBLT-1020-00	00BLT-1020-00	32	Deluxe Refill Station, SCD
5IBLT-1022-xx	00BLT-1022-xx	33	AN800-3 Bulkhead Refill Assembly, SCD
5SMAN-002x-00	00MAN-002x-00	34-35	Low Profile Manifold Assembly, SCD
5SMAN-0012-00	00MAN-0012-00	36	High Pressure Tee Manifold, (3) SAE-4F, SCD
5SCMK-001-000	00CMK-00xx-0x	37	Cylinder Mounting Kit Chart, SCD
5ICMK-0004-00	00CMK-003x-00	38	Cylinder Mounting Brackets, Short/Tall, SCD
5ICMK-0006-00	00CMK-00xx-13	39	Cylinder Mounting Kits, Saddle Bracket Style, SCD
5SBNJ-002-100	19055-x002-0x	40-41	Banjo Fittings, SCD
5ICR0-0118-00	APCR0-011x-00	42	4-Way Pneumatic Valve Switch, SCD
5I930-0001-00	19600-000x-00	43	Low Pressure Polyurethane Tubing, SCD
5SHDW-0100-00	00HDW-0xxx-xx	44-47	High Pressure Copper Tubing & Fittings, SCD
5IREG-1091-01	00REG-1091-01	48	High Pressure High Flow Regulator

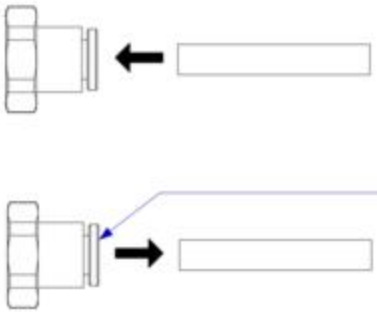
OPTIONAL EQUIPMENT:

(See RCV/RCR Customer Configuration Worksheet (5RCV2-0001-00) for details).

RCV/RCR CUSTOMER CONFIGURATION OPTIONS	MH PART NUMBER	UN-VALVED PORTS					VALVED PORTS		
		PRD	TANK 1	TANK 2	TANK 3	AXIAL	VALVE 1	VALVE 2	VALVE 3
COMPRESSION FITTING SAE-4 to 1/8" TUBE (LOW-VOLUME)	00HDW-0108-05		☐	☐	☐	☐	☐	☐	☐
COMPRESSION FITTING SAE-4 to 3/16" TUBE (HIGH-VOLUME)	00HDW-0110-05		☐	☐	☐	☐	☐	☐	☐
JIC ADAPTER FITTING (SAE-4M TO JIC-4 FLARE)	00HDW-1381-01		☐	☐	☐	☐	☐	☐	☐
CHECK VALVE FILL-PORT, SAE-4 to AN-800-3	00BLT-1010-00		☐	☐	☐	☐			
CHECK VALVE FILL-PORT, SAE-4 to SCOTT 9/16-18	00BLT-1012-00		☐	☐	☐	☐			
TRANSDUCER/GAUGE 1.25" (2D & 2DL)	41000-0030-01 00CPG-1014-00		☐	☐	☐		☐	☐	☐
TRANSDUCER/GAUGE KIT (2DP)	00BLT-1072-00 (T/G KIT) 0RV02-0001-00 (DB KIT)		☐	☐	☐		☐	☐	☐
HP/HF REGULATOR (SAE-4 X 6MM TUBE, AXIAL)	00REG-1091-01						☐	☐	☐
SAE-4 PORT PLUG	00HDW-0386-00		☐	☐	☐	☐	☐	☐	☐

REV	ECO	Release	Drawn	REVISION HISTORY
-3	2019-008	2019-02-14	SGO	Product Insert Drawing

TUBING CONNECTION



INSERTING

Push in the tubing

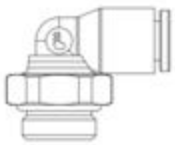
REMOVING

1. Push in the connector collar
2. Pull the tube straight back while holding the collar in

To INSERT TUBING: push the tubing into the connector until resistance is felt, **then push a little further, about 1/8 inch [3 mm].** Gently tug on the tubing to make sure it is captured.

To REMOVE TUBING: push the tubing in slightly, then push in the connector collar while pulling gently on the tubing.

When removing tubing, ***DO NOT* pull on the tubing without pushing in the collar,** as this will likely damage the connector.



Note: Alternate outlet fitting provided.

- Replace installed fitting as preferred.
- Maintain cleanliness for oxygen service.
- Torque to 20 in-lbs.
- No Teflon tape required.

GENERAL SPECIFICATIONS

Material:	UNS C36000 (CDA-360) Brass UNS A96061 (6061-T6) Aluminum
Inlet Pressure Rating:	3000 PSI MAX
Regulated Outlet:	16 ± 2 PSI (Dynamic) (NOM 1 Bar) 20 ± 2 PSI (Static)
Average Flow Rate:	40 L/min (AVG)
Temperature Range:	-50°F to +130°F [-45°C to +55°C]
Inlet Fitting:	SAE-4M
Replacement O-ring:	MH p/n 09001-1904-70 (SAE-4)

	Outlet Fitting	Weight
1096-04:	G-1/8 BSPP x 4mm Tube	3.1 oz [88 g]
1096-06:	G-1/8 BSPP x 6mm Tube	3.1 oz [88 g]

See also: MH document 5SREG-1096-0x

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 2018-09-25
CHECKED
ENGINEER
APPROVED

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

DWG TITLE: Regulator, 2-Stage Axial, No Gauge, SAE-4M x Tube Outlet [Insert]

DWG NUMBER: **5IREG-1096-0x** DWG REV. -3

CAD FILE: 00REG-1092'1096-xx$-3
INV. PART NUMBER: 00REG-1096-04, 00REG-1096-06
PROD. NAME: XCR-SAE-2SA-1P-4mm, EOS-SAE-2SA-1P-6mm

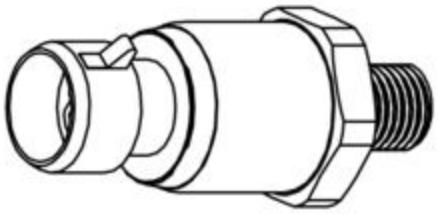
DWG FORMAT: ESR-002 Rev H [20]
DWG SCALE
DWG SHEET 1 OF 1
DWG SIZE A 11x8½

Insert #: 5IREG-1096-0x

REVISION HISTORY			
REV	ECO NO. YYYY-MM-DD	NAME	NOTES
-	2025-022 2025-06-04	KQM	INITIAL RELEASE

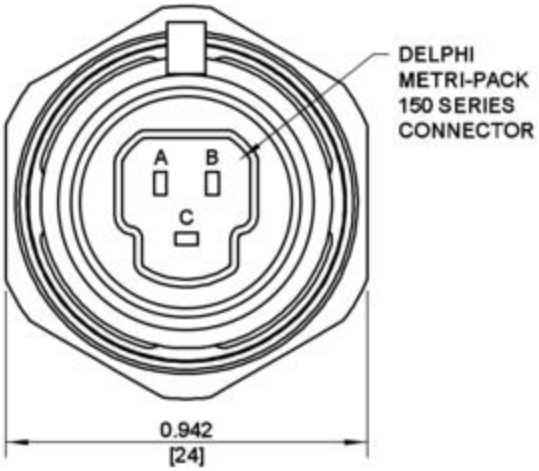
NOTES AND SPECIFICATIONS:

MFR:.....WIKA
OEM p/n:.....76210427
WEIGHT:.....≈80g [0.1767 lbs.]
VOLTAGE RANGE:.....8~30 VDC @ 4~20mA
CIRCUIT:.....2-wire current-loop interface
FULL-SCALE OUTPUT:.....4~20mA
(4mA = 0 psig., 20mA = 3000 psig.)
ELECTRICAL LOAD (Ω):.....≤(Supply voltage - 8V)/0.02A = LOAD
ACCURACY (Max. error):.....≤1.2% (of span)
LONG-TERM STABILITY:.....≤0.3% (of span/year)
TEMP RANGE:.....-22°~212°F (-30°~100°C)
SHOCK:.....40g per IEC 60068-2-27
VIBRATION:.....20g per IEC 60068-2-6
ELECTRICAL PROTECTION:.....Protected against overvoltage, short circuiting, and reverse polarity
OPERATING PRESSURE:.....0 to 3,000 psig. (0 to 207 bar)
MAX MEASURING RANGE:.....8,700psi. (600 bar)
OVER-PRESSURE LIMIT:.....12,440psi. (850 bar)
SERVICE LIFE:.....10,000,000 load cycles

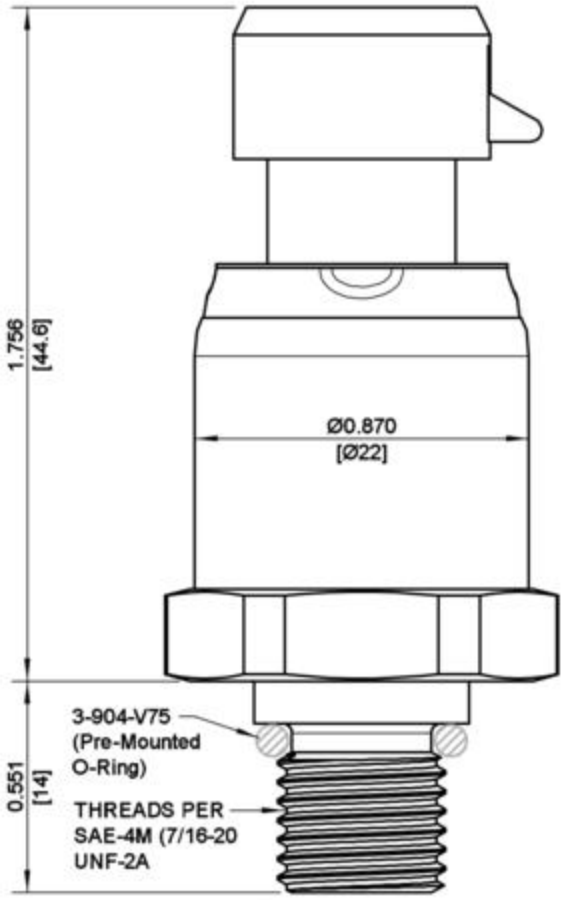


3D View

VIEW INTO END OF TRANSDUCER SOCKET



CONNECTOR (FRONT) VIEW



SIDE VIEW

A: 4 - 20mA OUTPUT to Gauge

B: +8 to +30 VDC

C: NOT USED

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

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

DRAWN	KQM 2025-06-04
CHECKED	EAM 2025-06-05
ENGINEER	JB 2025-06-05
APPROVED	HBS 2025-06-05

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

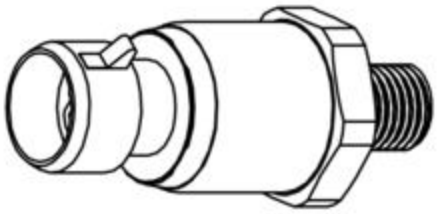
DOC TITLE	WIKA 4-20mA 0-3k PSIG transducer (Pressure Sending Unit) [SCD]
DOC NUMBER	5ICPG-1005-01
DWG REV.	-
SRCFILE	4100x-0030-01$-
INV. PART NUMBER	41000-0030-01
MODEL:	N/A
DWG FORMAT:	ESR-002 Rev H [27]
DWG SCALE	2:1
DWG SHEET	1 OF 1
DWG SIZE	A 11x8½

INSERT #: 5ICPG-1005-01

REVISION HISTORY			
REV	ECO NO. YYYY-MM-DD	NAME	NOTES
-	2025-022 2025-06-04	KQM	INITIAL RELEASE

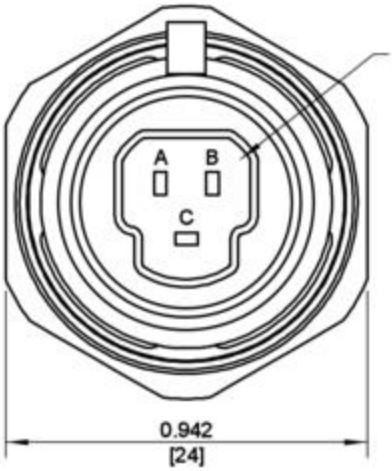
NOTES AND SPECIFICATIONS:

MFR:.....WIKA
OEM p/n:.....52853796
WEIGHT:.....≈80g [0.1767 lbs.]
VOLTAGE RANGE:.....8~30Vdc @ 5mA
CIRCUIT:.....3-wire voltage interface
FULL-SCALE OUTPUT:.....1-5Vdc
(1Vdc = 0 psig., 5Vdc = 3000 psig.)
ELECTRICAL LOAD (Ω):.....> Max Output Signal / 1mA = LOAD
ACCURACY (Max. error):.....≤1.2% (of span)
LONG-TERM STABILITY:.....≤0.3% (of span/year)
TEMP RANGE:.....-22°~212°F (-30°~100°C)
SHOCK:.....40g per IEC 60068-2-27
VIBRATION:.....20g per IEC 60068-2-6
ELECTRICAL PROTECTION:.....Protected against overvoltage, short circuiting, and reverse polarity
OPERATING PRESSURE:.....0 to 3,000 psig. (0 to 207 bar)
MAX MEASURING RANGE:.....8,700psi. (600 bar)
OVER-PRESSURE LIMIT:.....12,440psi. (850 bar)
SERVICE LIFE:.....10,000,000 load cycles

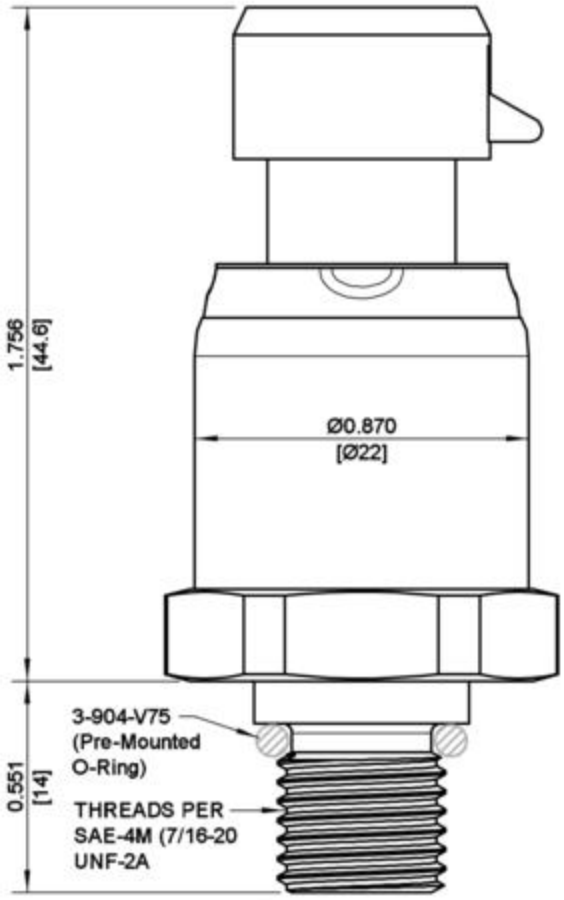


3D View

VIEW INTO END OF TRANSDUCER SOCKET



CONNECTOR (FRONT) VIEW



SIDE VIEW

A: COM

B: +8 to +30 VDC

C: 1-5Vdc Signal out

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

THIRD ANGLE PROJECTION

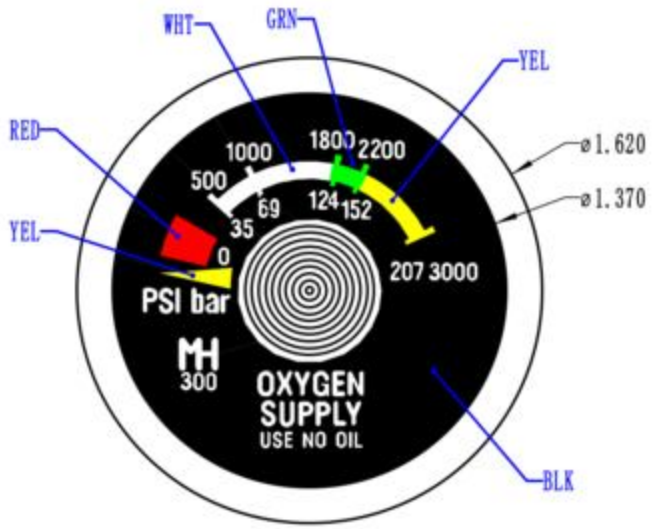
DO NOT SCALE DRAWING

DRAWN	KQM	2025-06-04
CHECKED	EAM	2025-06-05
ENGINEER	JB	2025-06-05
APPROVED	HBS	2025-06-05

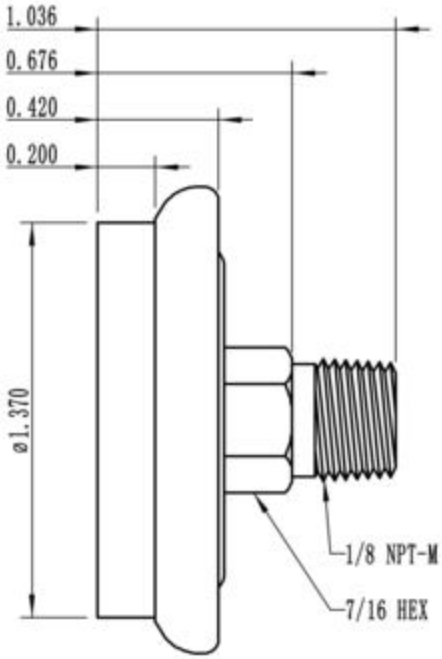
MOUNTAIN HIGH E&S CO.
REDMOND, OR. USA

DOC TITLE	WIKA 1-5Vdc 0-3k PSIG transducer (Pressure Sending Unit) [SCD]				
DOC NUMBER	5ICPG-0030-01			DWG REV.	-
SRCFILE	4100x-0030-01$-	INV. PART NUMBER	41002-0030-01	MODEL:	N/A
DWG FORMAT:	ESR-002 Rev H [27]	DWG SCALE	2:1	DWG SHEET	1 OF 1
DWG SIZE	A 11x8½				

INSERT #: 5ICPG-0030-01



FRONT VIEW



SIDE VIEW

REVISION HISTORY			
REV	ECO NO. YYYY-MM-DD	NAME	NOTES
A	2004-07-00	PLM	CHANGED TO NEW FORMAT
B	2009-20-00	PLM	CHANGED TO SHOW PROPER DETAIL ON GAUGE
C	2011-28-00	PLM	ADDED COLOR DETAIL ON GAUGE DIAL (WAS DWG. NO. E900130)
C1	2019-05-21	SGO	CHANGE SWG #: WAS 9500-003, IS 5SCPG-1010-00
D	2024-043 2024-08-01	KQM	DRAWING WE-WORK & REVISIONS

INSTALLATION NOTES:

1. Inspect gauge to ensure that male threads are free of nicks, burrs, dirt, ect. before wrapping with tape.

2. Wrap threads with oxygen compatible tape 1-1/2 to 2 turns in a clockwise direction when viewed from end. Start at the 2nd thread from the end to avoid any tape debris contamination in the system.

3. Screw the gauge into adapter fitting, ensuring threads are properly aligned. Torque to finger tight.

4. Torque to final value with wrench, 2-3 turns from finger tight (TFFT)

5. SEE MH-300 Installation Drawing insert (MH Document #: 5ICPG-0030-00) for detailed panel installation instructions.

SPECIFICATIONS:

MATERIAL:	BRASS, STAINLESS STEEL, & ACRYLIC
MAX. PRESSURE:	207 BAR (3000 PSIG)
OPERATING RANGE:	152 BAR (0-2200 PSIG)
REAR AXIAL PORT:	1/8 NPT-M
TEMP RANGE:	-25° F TO 225° F
OEM VEN CODE:	1057
TORQUE:	2-3 TFFT
RECOMMENDED TAPE:	PTFE OXYGEN COMPATIBLE ("A-A-58092" or MH p/n: 00VEN-0112-01)

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

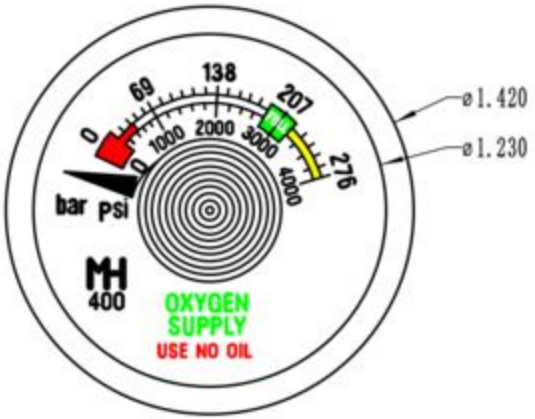
THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

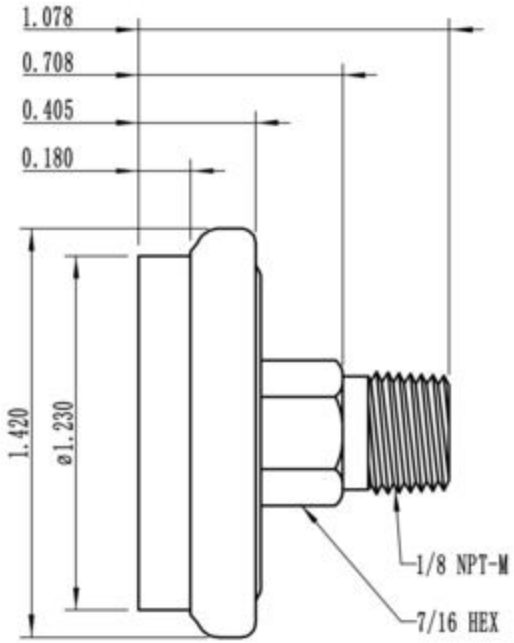
MH MOUNTAIN HIGH E&S CO.
REDMOND, OR. USA

DRAWN	KQM 2024-08-01	DOC TITLE	MH-300 Pressure Gauge (SCD)		
CHECKED	EAM 2024-08-07	DOC NUMBER	5SCPG-1010-00	DWG REV.	D
ENGINEER	JB 2024-08-07	SRCFILE	5SCPG-1010-00$D	INV. PART NUMBER	00CPG-1010-00
APPROVED	HBS 2024-08-13	DWG FORMAT:	ESR-002 Rev H [27]	DWG SCALE	1.5:1
		MODEL:		DWG SHEET	1 OF 1
				DWG SIZE	A 11x8½

REVISION HISTORY			
REV	ECO NO. YYYY-MM-DD	NAME	NOTES
-	1996-04-27	PLM	INITIAL DRAFT
A	2009-01-28	PLM	CORRECTED TEXT ON SCALE AND PLACED ON NEW FORMAT
B	2024-045 2024-08-07	KQM	DRAWING WE-WORK & REVISIONS



FRONT VIEW



SIDE VIEW

Note: Gauge marked per MH in-house document: ESR-005

INSTALLATION NOTES:

1. Clean per MH in-house document: ESR-008

2. Inspect gauge to ensure that male threads are free of nicks, burrs, dirt, ect. before wrapping with tape.

3. Wrap threads with oxygen compatible tape 1-1/2 to 2 turns in a clockwise direction when viewed from end. Start at the 2nd thread from the end to avoid any tape debris contamination in the system.

4. Screw the gauge into adapter fitting, ensuring threads are properly aligned. Torque to finger tight.

5. Torque to final value with wrench, 2-3 turns from finger tight (TFFT)

SPECIFICATIONS:

MATERIAL:	BRASS, STAINLESS STEEL, & ACRYLIC
FINISH:	NONE
MAX. PRESSURE:	276 BAR (4000 PSIG)
OPERATING RANGE:	207 BAR (0-3000 PSIG)
REAR AXIAL PORT:	1/8 NPT-M
TEMP RANGE:	-25° F TO 225° F
TORQUE:	2-3 TFFT
RECOMMENDED TAPE:	PTFE OXYGEN COMPATIBLE ("A-A-58092" or MH p/n: 00VEN-0112-01)

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES.
DIMENSIONS IN [ ] ARE MILLIMETERS (REF)
TOLERANCES ARE:
0.X ±0.015 ANGLES ± 3°
0.XX ±0.010 FRACTIONS ± 1/64
0.XXX ±0.005
INTERPRET GD&T PER ASME 14.5
63
THIRD ANGLE PROJECTION
DO NOT SCALE DRAWING

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

DRAWN KQM 2024-08-07	DOC TITLE	MH-400 Pressure Gauge (SCD)		
CHECKED EAM 2024-08-07	DOC NUMBER	5SCPG-1011-00	DWG REV.	B
ENGINEER JB 2024-08-07	SRCFILE 5SCPG-1011-00$B	INV. PART NUMBER 00CPG-1011-00	MODEL:	
APPROVED HBS 2024-08-13	DWG FORMAT: ESR-002 Rev H [27]	DWG SCALE 1.5:1	DWG SHEET 1 OF 1	DWG SIZE A 11x8½

REVISION HISTORY			
REV	ECO NO. YYYY-MM-DD	NAME	NOTES
-2	2024-044 2024-08-07	KQM	RE-RELEASE AS INSERT

INSTALLATION NOTES:

1.Cut out gauge holes in Aircraft Panel (05) in desired location:
- Center Gauge Face Hole: Ø1.375" (1-3/8")(35.26mm)
- Fastener Holes (x4): Ø0.15" (3.85mm)
- Use reference circle (as shown in Front View) for fastener hole spacing. (Ø2.121")

2.Inspect Gauge (01) to ensure that male threads are free of nicks, burrs, dirt, ect. before wrapping with tape.

3.Wrap threads with oxygen compatible tape 1-1/2 to 2 turns in a clockwise direction when viewed from end. Start at the 2nd thread from the end to avoid any tape debris contamination in the system.

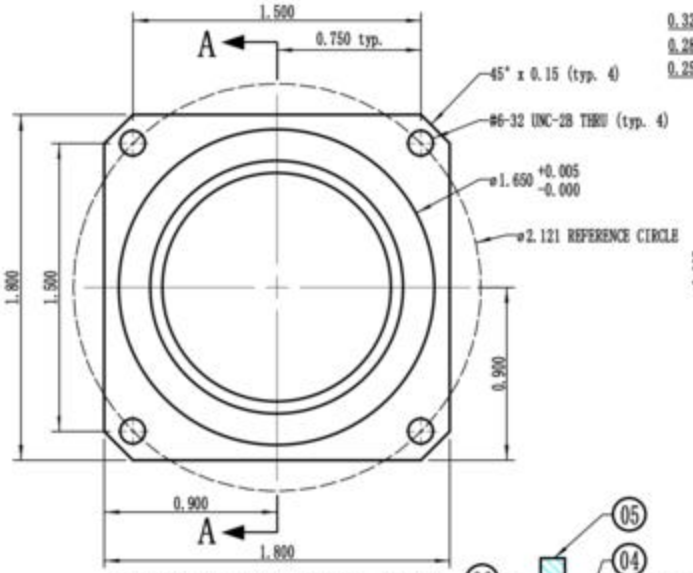
4. Screw the Gauge into NPT-TO-(XX) (CHOOSE ADAPTER AS REQUIRED) fitting (02), ensuring threads are properly aligned. Torque to finger tight.

5. Torque to final value with wrench, 2-3 turns from finger tight (TFFT).

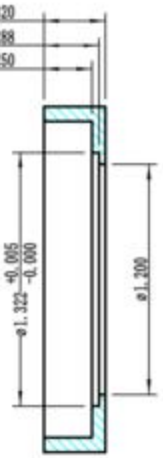
6. Place o-ring (03) into Rear Mount Gauge Plate (04) as shown, then place Gauge into matching recess of Rear Mount Gauge Plate.

7. Install Rear Mount Gauge Plate & Gauge Assembly (01-04) into the back of the Aircraft Panel (05) so that the face of the gauge protrudes through the Ø1.375" center hole & the threaded fastener holes on the Rear Mount Gauge Plate are alligned with the Ø.15" fastener holes in the Aircraft Panel.

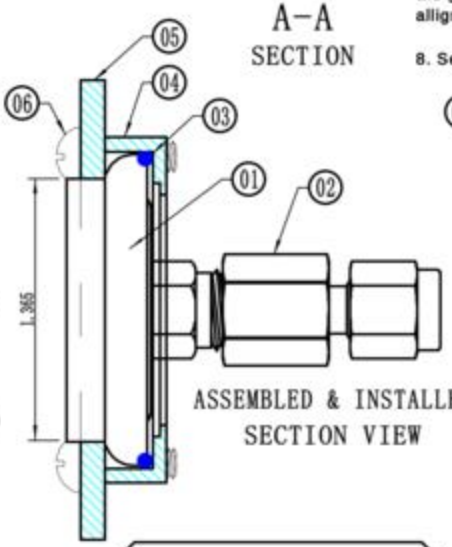
8. Secure entire assembly to Aircraft Panel with (x4) 3/8" #6-32 UNC-2B Panhead Machine Screws (06)(09105-0606-00).



GAUGE PLATE FRONT VIEW

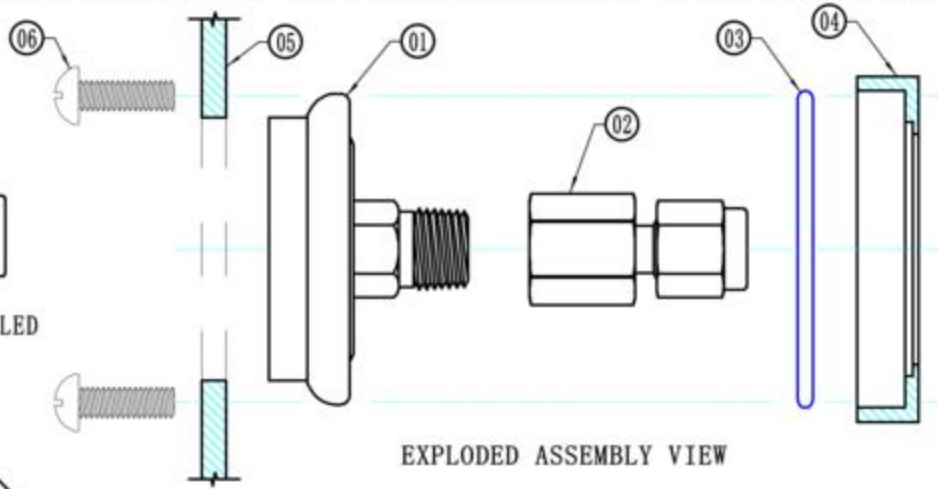


A-A
SECTION

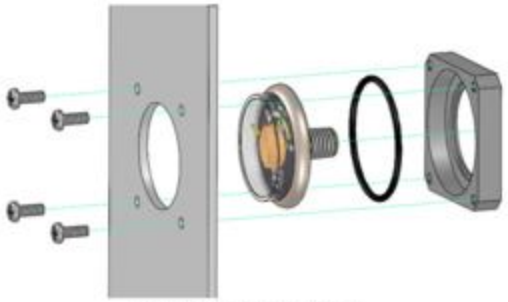


ASSEMBLED & INSTALLED
SECTION VIEW

01 MH-300 PRESSURE GAUGE, 0-3000PSI (00CPG-1010-00)
02 1/8 NPT-F to 1/8" O.D. TUBE ADAPTER FITTING (00HDW-0120-00)
03 O-RING, 2-029 S-050 (09001-1029-70)
04 REAR MOUNT GAUGE PLATE (00BLT-1076-00)
05 CUSTOMER AIRCRAFT PANEL
06 PANHEAD MACHINE SCREW, #6-32 UNC-2B (09105-0606-00)



EXPLODED ASSEMBLY VIEW



3D ASSEMBLY VIEW

ASSEMBLED FRONT VIEW

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

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

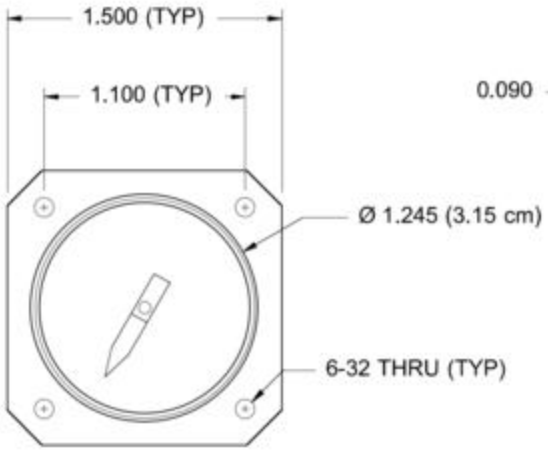
MOUNTAIN HIGH E&S CO.
REDMOND, OR. USA

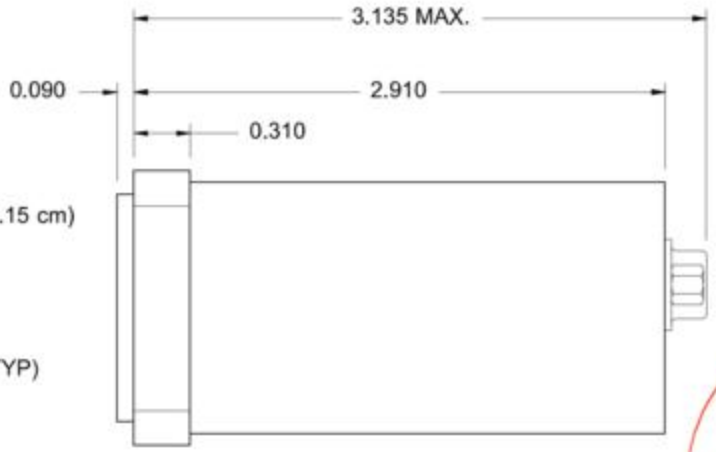
DOC TITLE	Rear Mount Gauge Plate Drawing & MH-300 Panel Installation Insert				
DRAWN	KQM 2024-08-06	DOC/INSERT NUMBER	5ICPG-0030-00	REV.	-2
CHECKED	EAM 2024-08-07				
ENGINEER	JB 2024-08-07	SRCFILE 00CPG-0030-00$-2	INV. PART NUMBER 00CPG-0030-00	MODEL:	
APPROVED	HBS 2024-08-13	DWG FORMAT: ESR-002 Rev H [27]	DWG SCALE 1:1	SHEET #: 1 OF 1	DWG SIZE A 11x8½

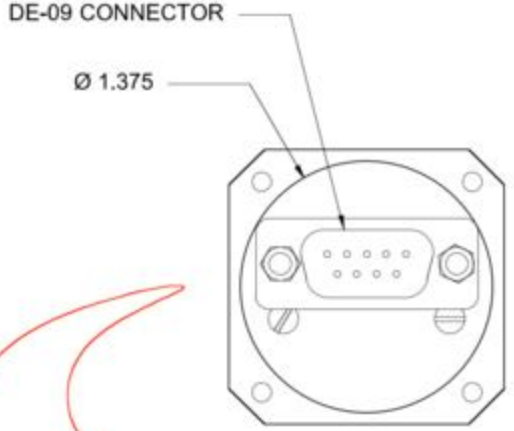
INSERT #: 5ICPG-0030-00

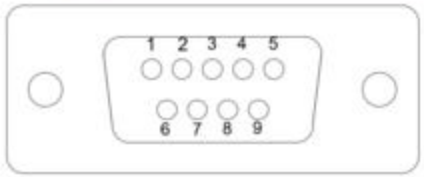
REVISION HISTORY

REV	MO-DA-YR	NEO / ECO	APPROVED	NOTES
A	11-24-00	PLM	PLM	CORRECTED HOLE SPACING & DIA.
B	07-07-07	PLM	PLM	UPGRADED DRAWING TO REFLECT CURRENT VERSION OF GAUGE
C	10-06-11	PLM	PLM	SIMPLIFIED REAR-VIEW DETAIL
D	2024-11-21	2024-064	KQM	REVISED PIN 3, N/C

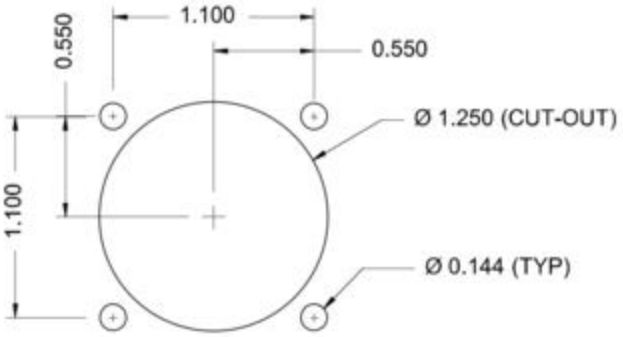








1: +12 TO +32 VDC POWER INPUT
2: INTERNALLY CONNECTED TO PIN 1
3: N/C (connecting to N/C may damage gauge)
4: N/C
5: INPUT (4 - 20 MA PRESSURE SENDING UNIT)
6: EL INTERNAL LIGHTING AC INPUT
7: EL INTERNAL LIGHTING AC INPUT
8: INTERNALLY CONNECTED TO PIN 9
9: GROUND



MODEL EPG-601A

ITM.# 00BLT-1072-00

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 PER ASME 14.5
63
FMT REV G

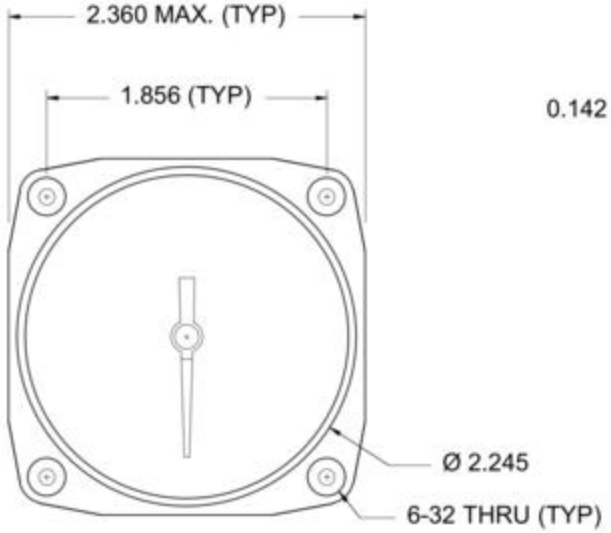
THIRD ANGLE PROJECTION
DO NOT SCALE DRAWING

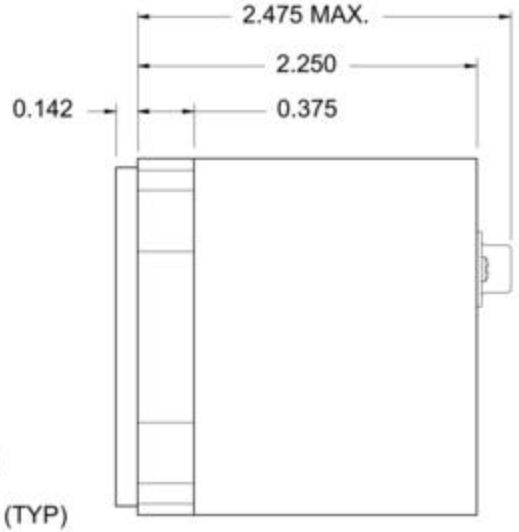
MOUNTAIN HIGH E&S CO.
REDMOND, OR. USA

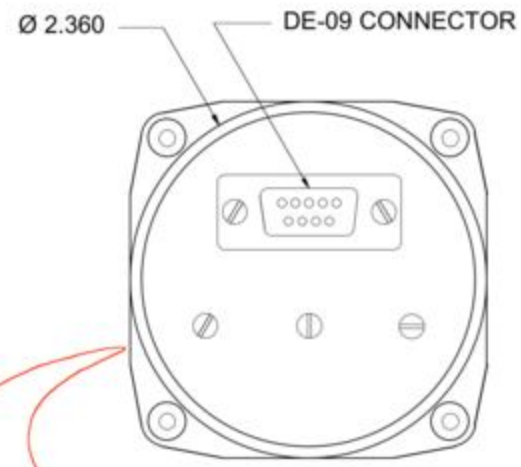
[KC] 00 NUMBER OF KEY CHARACTERISTICS IN THIS DRAWING / DOCUMENT PER MH DOC: ESR-001

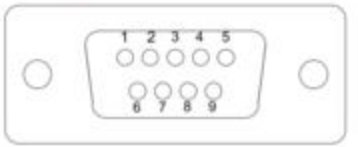
ORIG.:	PLM	11-10-00		OXYGEN E-GAUGE, 1.5" FORM-FACTOR (SCD)	
DRWN.:	PLM	11-10-00		DWG. # 0EPG6-051-001	REV D SIZE A
ENG.:	PLM	11-10-00		MOD.# EPG-601A	ITM.# 00BLT-1072-00
APPR.:	NAME	MO-DA-YR		SHEET 1 OF 1	CUSTOMER CODE

REVISION HISTORY				
REV	MO-DA-YR	NEO / ECO	APPROVED	NOTES
-	11-10-00	PLM.	PLM.	INITIAL DRAFT
A	11-24-00	PLM.	PLM.	CORRECTED HOLE SPACING & DIA.
B	10-06-11	PLM	PLM	SIMPLIFIED REAR-VIEW DETAIL
C	2024-11-27	2024-064	KQM	ADDED INSERT # & CORRECTED PIN 3 TO N/C

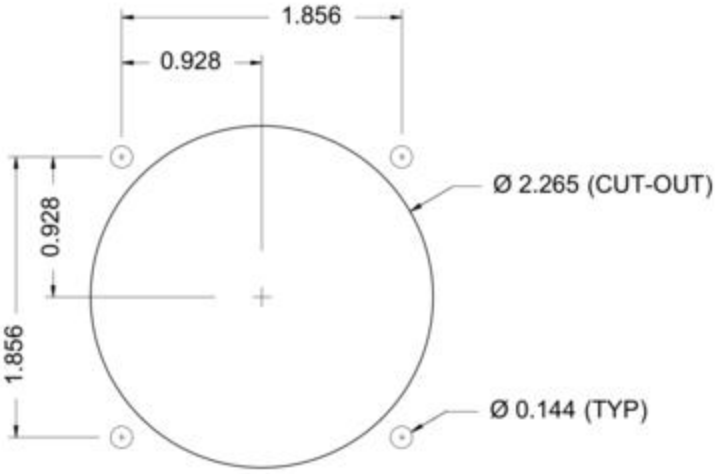








1: +12 TO +32 VDC POWER INPUT
2: INTERNALLY CONNECTED TO PIN 1
3: N/C (connecting to N/C may damage gauge)
4: N/C
5: INPUT (4 - 20 MA PRESSURE SENDING UNIT)
6: EL INTERNAL LIGHTING AC INPUT
7: EL INTERNAL LIGHTING AC INPUT
8: INTERNALLY CONNECTED TO PIN 9
9: GROUND



MODEL EPG-600A

ITM.# 00BLT-1074-00

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 PER ASME 14.5
63
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	11-10-00		OXYGEN E-GAUGE, 2.25" FORM-FACTOR (SCD)	
DRWN.:	PLM	11-10-00		DWG. # 0EPG6-051-002	REV C / SIZE A
ENG.:	PLM	11-10-00		MOD.# EPG-600A	ITM.# 00BLT-1074-00
APPR.:	NAME	MO-DA-YR		SHEET 1 OF 1	CUSTOMER CODE

Insert # 5IEG6-0051-02

REVISION HISTORY			
REV	MO-DA-YR	E. C. O. / APPR.	NOTES
-	04-22-16	PLM	INITIAL RELEASE
A	2024-11-27	KQM	FIXED CONFLICTING p/n

NOTES & SPECIFICATIONS

MFG:	UMA 260 Main St. Dayton VA 22821
OEM PN:	EPG-600A & EPG-601A
WEIGHT (GAUGE UNIT ONLY):	EPG-600A = 178 g, (6.3 Oz.) , EPG-601A = 114 g. (4.3 Oz.)
MATERIAL LIST:	High-Temp Automotive ABS, FPR, Copper Brass, Iron & Steel
METER MOVMENT:	AIR-CORE Quadrature Inductive
VOLTAGE RANGE:	11.5 ~ 32 VDC @ ~ 120 ma.
GAUGE INPUT CIRCUIT:	2-wire. current-loop interface
GAUGE FULL-SCALE:	4-20 ma. (4 ma .= 0 psig., 20 ma .= 3,000 psig.)
ELECTRICAL CONNECTOR:	DE-09, 9-PIN D-SUB CONNECTOR
LP ELECTRICAL LOAD:	~ 100Ω
ACCURACY:	≤ 3.5% (of span)
REPODUCIBILITY:	≤ 1.8% (of span)
COMPENSATED TEMP RANGE:	32 ~ 120° F (0 ~ 50° C)
AMBIENT TEMP RANGE:	-40 ~ 140° F (-40 ~ 60° C)
SHOCK:	15 G. per DIN EN 837 (NYQ)
VIBRATION:	10 G. per IEC 68-2 (NYQ)
ELECTRICALAL PROTECTION:	Protected against moderate overvoltage & short circuiting
ALTITUDE:	-500 to +38,000 ft. SPA @ 27 °C
MTBF / MTTF:	~25 Years for both models @ 4-20 ma. @ 40 °C with 14VDC input

NOTE:
Gauge needle is driven by a High-Rel air-core quadrature coil and not spring driven to zero when off. Input currents between 4 & 20 ma. drive the needle between zero and full-scale. Input currents less than 4 ma. will drive needle below zero. The gauge may show approximately the last measured pressure when the power is removed.

EPG-601-A

EPG-600-A

NYQ: Not Yet Qualified

EPG-600A & 601A

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	04-22-16		OXYGEN E-GAUGE, DATA SHEET (SCD)	
DRWN.:	PLM	04-22-16		DWG. # 0EPG6-051-004	REV A / SIZE A
ENG.:	PLM	04-22-16		MOD.# EPG-600A/601A	ITM.# 00BLT-1072-0X
APPR.:	NAME	MO-DA-YR		SHEET 1 OF 1	CUSTOMER CODE

Insert # 5IEG6-0051-04

p/n: 00BLT-1010-00

Check Valve Assembly, SAE-4M x AN-800 w/ Cap & Chain

Date:

Cleaned for Oxygen Service per MH ESR-008

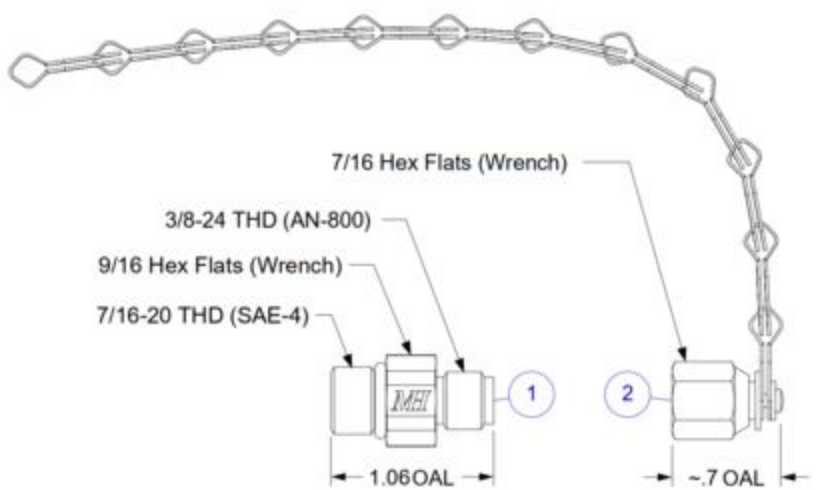
Aviation Oxygen Systems
MOUNTAIN HIGH
Equipment & Supply Company

REV	ECO	Release	Drawn	REVISION HISTORY
G0	2020-011	2020-06-02	SGO	Customer Drawing

GENERAL SPECIFICATIONS

Materials:	UNS C36000 (CDA-360) Brass UNS S30300 (303) Stainless Steel
Weight:	1.1 oz [32 g]
Working Pressure:	3000 PSI
Temp Range:	-50°F to +130°F [-45°C to +55°C]
Service Kit:	MH p/n KM100-1010-01

Cleaned for oxygen service per MH ESR-008



-00

Item	Qty	Description
1	1	SAE-4 to AN-800 Filler Body Assy
2	1	AN-800 Cap & Chain Assembly

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

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

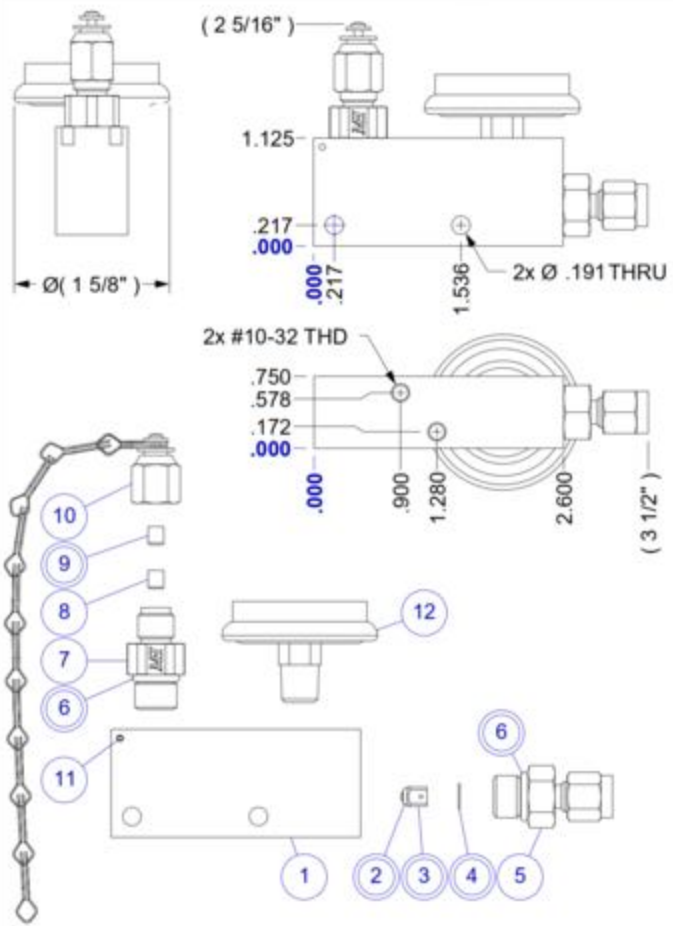
DRAWN SGO 2020-05-212
CHECKED
ENGINEER
APPROVED

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

DWG TITLE: Customer Drawing, Check Valve Assy, SAE-4M x AN-800 w/ Cap & Chain
DWG NUMBER: 5IBLT-1010-00
DWG REV.: G0
CAD FILE: 00BLT-1010-xx$G0
INV. PART NUMBER: 00BLT-1010-00
PROD. NAME:
DWG FORMAT: ESR-002 Rev H [23]
DWG SCALE:
DWG SHEET: 1 OF 1
DWG SIZE: A 11x8½

Insert #: 5IBLT-1010-00

REV	ECO	Release	Drawn	REVISION HISTORY
H0	2020-011	2020-06-02	SGO	Customer Drawing



Key

1 Item #

1 Service Kit Item

GENERAL SPECIFICATIONS

Materials:	UNS C36000 (CDA-360) Brass UNS A96061 (6061-T6) Aluminum UNS S30300 (303) Stainless Steel
Weight:	5.8 oz [165 g]
Working Pressure:	3000 PSI
Temp Range:	-50°F to +130°F [-45°C to +55°C]
Service Kit:	MH p/n KM100-1010-01 • Items (2)(3)(4)(6)(9) (indicated by double circle)

Cleaned for oxygen service per MH ESR-008

Installation

- Install Deluxe Fill Station per AC 43.13 Chapter 6
- THRU holes in side of Deluxe Fill Station manifold will accommodate #8 or #10 machine screws. Locate mounting holes per indicated dimensions, or match-drill.
- Threaded holes in bottom of manifold are for #10-32 fasteners. Locate mounting holes per indicated dimensions.
- MH-300 Pressure Gauge is included separately with the Deluxe Fill Station so that the gauge may be installed in the field and oriented as required. Gauge threads are 1/8-27 NPT and come pre-taped as a convenience.
- Leak-check gauge connection with snoop or equivalent
- If gauge is loosened or removed, remove old tape and re-apply new oxygen-compatible Teflon tape (e.g., MIL-SPEC T27730A) to NPT male threads prior to re-installation. Take care to maintain cleanliness of all parts of the oxygen system - failure to do so could create an ***extreme safety hazard.*** Refer to MH document # 5SHDW-0300-00 for information on cleaning/purging/installing oxygen system fittings.

REF	QTY	Description
1	1	Refill Body
2	1	O-Ring (AS-568-003)
3	1	Poppet
4	1	Retaining Ring
5	1	1/8" Tube Adapter
6	2	O-Ring (AS-568-904, SAE-4)
7	1	AN800-3 [3/8-24] Adapter
8	1	Orifice
9	1	Filter
10	1	AN800-3 Cap & Chain Assembly
11	1	Pin
12	1	MH-300 Medium Pressure Gauge

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

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

DRAWN SGO 2016-10-14
CHECKED
ENGINEER
APPROVED

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

DWG TITLE: Customer Drawing
Deluxe Refill Station [SCD]

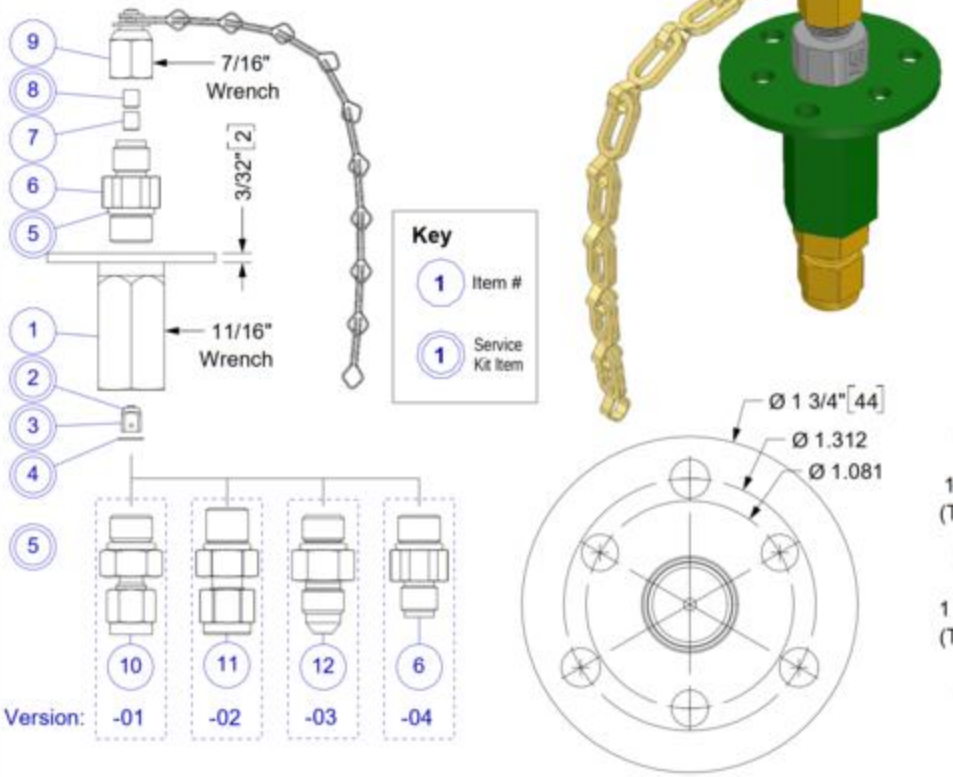
DWG NUMBER: **5IBLT-1020-00** DWG REV. **H0**

CAD FILE: 00BLT-1020-00$H0 INV. PART NUMBER: 00BLT-1020-00 PROD. NAME: Deluxe-Refill-Station

DWG FORMAT: ESR-002 Rev H [20] DWG SCALE DWG SHEET 1 OF 1 DWG SIZE A 11x8½

Insert #: 5IBLT-1020-00

REV	ECO	Release	Drawn	REVISION HISTORY
G0	2020-011	2020-06-02	SGO	Customer Drawing



GENERAL SPECIFICATIONS

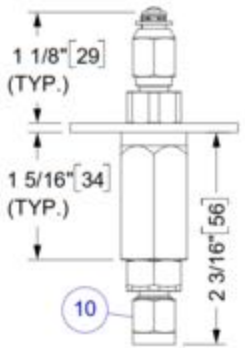
Materials: UNS C36000 (CDA-360) Brass
UNS A96061 (6061-T6) Aluminum
UNS S30300 (303) Stainless Steel

Weight: 3.0 oz [85 g]
Working Pressure: 3000 PSI
Temp Range: -50°F to +130°F [-45°C to +55°C]

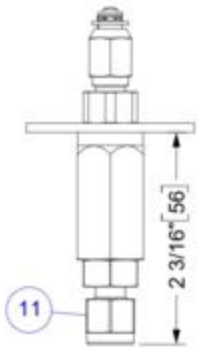
Service Kit: MH p/n KM100-1010-01
- Items (2)(3)(4)(5)(8) (indicated by double circle)

Cleaned for oxygen service per MH ESR-008

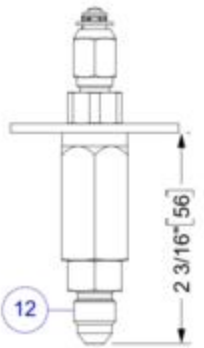
Inlet: AN800-3 [3/8-24]



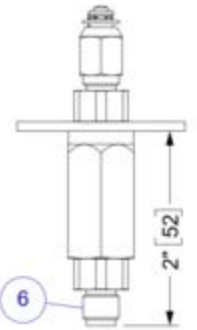
00BLT-1022-01
1/8" Tube



00BLT-1022-02
3/16" Tube



00BLT-1022-03
JIC-4



00BLT-1022-04
AN800-3

REF	-01	-02	-03	-04	Description
1	1	1	1	1	Bulkhead Adapter w/ Check-Valve
2	1	1	1	1	O-Ring (AS-568-003)
3	1	1	1	1	Poppet
4	1	1	1	1	Retaining Ring
5	2	2	2	2	O-Ring (AS-568-904, SAE-4)
6	1	1	1	2	AN800-3 [3/8-24] Adapter
7	1	1	1	1	Orifice
8	1	1	1	1	Filter
9	1	1	1	1	AN-800-3 Cap & Chain Assembly
10	1				1/8" Tube Adapter
11		1			3/16" Tube Adapter
12			1		JIC-4 37° Flare Adapter

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

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: Customer Drawing, Bulkhead Refill Assembly, AN800-3 Inlet Versions [SCD]
DWG NUMBER: **5IBLT-1022-xx**
DWG REV.: **G0**
CAD FILE: 00BLT-1022-xx$G0
INV. PART NUMBER: 00BLT-1022-xx
PROD. NAME: AN800-B-H-Fill-xxxx
DWG FORMAT: ESR-002 Rev H [20]
DWG SCALE:
DWG SHEET: 1 OF 1
DWG SIZE: A 11x8½

Insert #: 5IBLT-1022-xx

Low Profile Manifold Assembly

The Low Profile Manifold Assembly (LPM) is available in 3 different configurations to suit the cylinder family that it is to be paired with (see "Low Profile Manifold Assembly Configurations" table below). Each configuration includes the proper cylinder-seal O-ring to match the relevant cylinder mounting port, and a High Pressure Relief Device (HPRD) of the correct rating for the cylinder. Contact Mountain High Equipment & Supply (MH) for help in selecting the proper configuration for your needs.

Notes and Cautions:

- Do not use a cylinder with an incorrect HPRD , or without an HPRD (by sealing/plugging the HPRD port) - severe damage, serious injury or death could result!
- If the cylinder used with an existing LPM is being exchanged, the cylinder-seal O-ring should be replaced.
- If the cylinder is being replaced with a different one, the HPRD may also need to be replaced with another of the proper pressure rating for the new cylinder.
- Do not attempt to re-use an HPRD - once an HPRD is removed, it must be replaced.
- Replacement/spare parts are available from MH (see "Assembly Configurations" table).

The LPM includes 3 general-purpose J1926 SAE-4F radial ports that are occupied in the default configuration by a 1/8" tube compression fitting, a 3/16" tube compression fitting, and a plug. If ordered together with a cylinder, the LPM can be installed onto the cylinder by MH. Other configurations can also be supplied upon request – contact MH for more information.

LPM assemblies as received from MH have been leak-tested and all fittings have been installed with proper torque. The default fittings may be rearranged or exchanged for other SAE-4M fittings as needed, with the following cautions:

- Never work on a pressurized system.
- Install fittings to the proper torque specification using proper tools and procedures.
- Cleanliness is critical. Contaminants such as oil, unapproved lubricants or cleaning agents, or metal particles, pose an extreme safety hazard with the potential of fire or explosion.
- Tubing and Fittings obtained from MH have been cleaned for oxygen service and should not need to be re-cleaned so long as proper hygiene has been maintained. Tubing and Fittings obtained elsewhere (even if the same part) may therefore not be suitable for use in oxygen systems unless it is known for certain that they have been properly cleaned.

REVISION HISTORY			
REV	ECO NO. YYYY-MM-DD	NAME	NOTES
C1	2017-023 2017-07-17	SGO	Customer Drawing
C2	2024-053 2024-10-16	KQM/SGO	HPRD p/n Revision
C3	2025-051 2025-10-28	KQM	Drawing Revisions

GENERAL SPECIFICATIONS:

Material:	UNS A96061 (6061-T6) Aluminum (LPM Body) Stainless Steel (Fittings)
Weight:	4.0 oz [112 g] (default configuration)
Ports:	(see Sheet 2)
Pressure Rating:	Based on Cylinder & HPRD (See Table)
Temp Range:	-65°F to +160°F [-54°C to +71°C]
Pressure Relief:	(per Assembly Configurations Table)
Clean:	For Oxygen Service per MH ESR-008

Low Profile Manifold Assembly Configurations

LPM Assembly MH p/n	MH Cylinder Application	Cylinder Service Pressure	Cylinder O-Ring Mh p/n	HPRD MH p/n
00MAN-0022-00	CFF-480	3000	09001-3908-70	00VEN-0009-00
00MAN-0024-00	AL, CFFC	2015-2216	09001-0210-90	00VEN-0015-00
00MAN-0026-00	KF	1800	09001-3908-70	00VEN-0011-00

High Pressure Relief Device Characteristics

HPRD MH p/n	MH Cylinder Application	Cylinder Service Pressure	Disc Rupture Range PSIG @ 160°F MIN-MAX	Rupture Disc Marking
00VEN-0009-00	CFF-480	3000	4500-5000	BLK, -48
00VEN-0011-00	KF	1800	2700-3000	ORN, -28
00VEN-0015-00	AL, CFFC	2015-2216	3025-3360	YEL, -32

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

THIRD ANGLE PROJECTION

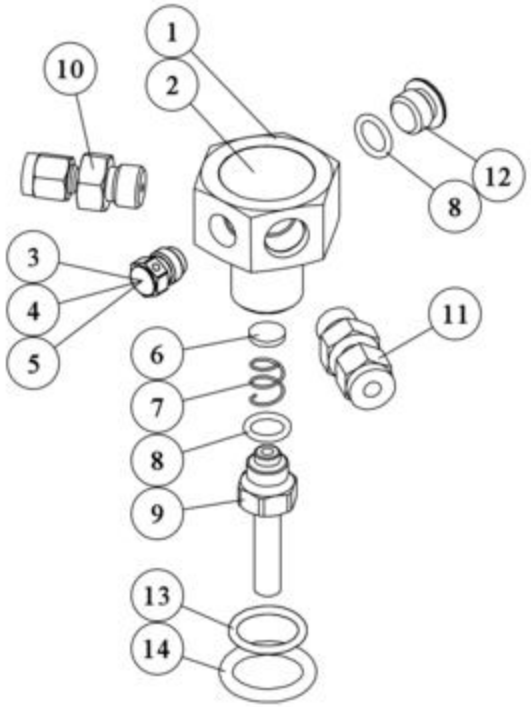
DO NOT SCALE DRAWING

DRAWN	SGO 2017-07-10				
CHECKED	EAM 2024-10-08	DOC NUMBER	5SMAN-002x-00	DWG REV.	C3
ENGINEER	JB 2024-10-08	SRCFILE 00MAN-002x-00$C2	INV. PART NUMBER 00MAN-002x-00	MODEL:	LPM-75-xx
APPROVED	HBS 2024-10-08	DWG FORMAT: ESR-002 Rev H [27]	DWG SCALE 1:1	DWG SHEET 1 OF 2	DWG SIZE A 11x8½

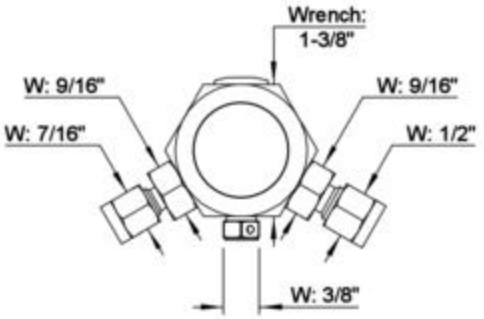
MOUNTAIN HIGH E&S CO.
REDMOND, OR. USA

DOC TITLE: Customer Drawing, Low Profile Manifold Assembly [SCD]

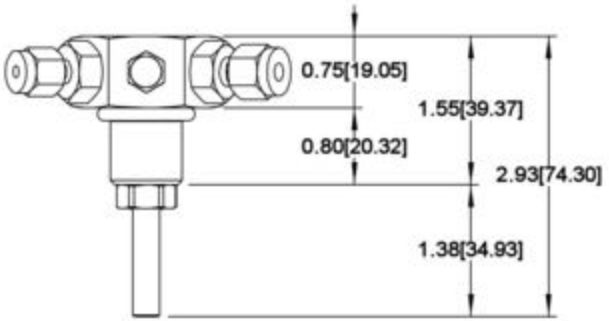
Insert #: 5IMAN-002x-00



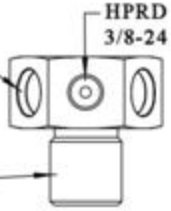
EXPLODED VIEW



TOP



FRONT



ITEM	0022	0024	0026	PART NUMBER	DESCRIPTION
1	1	1	1	00MAN-0020-00	Low Profile Manif old
2	1	1	1	5RGX0-0001-00	Label
3	1			00VEN-0009-00	Burst Plug, 3000 psi service (CFF)
4		1		00VEN-0015-00	Burst Plug, 2015 psi service (AL/CFFC)
5			1	00VEN-0011-00	Burst Plug, 1850 psi service (KF)
6	1	1	1	09025-0001-00	Filter Disc
7	1	1	1	09010-0005-00	Spring
8	2	2	2	09001-3904-70	O-ring, SAE-4
9	1	1	1	ARV01-0120-00	Diptube
10	1	1	1	00HDW-0108-01	SAE-4M x 1/8" Tube Adapter, SS
11	1	1	1	00HDW-0110-00	SAE-4M x 3/16" Tube Adapter, SS
12	1	1	1	19035-0004-02	SAE-4M Port Plug
13	1		1	09001-3908-70	O-ring, SAE-8 (KF/CFF)
14		1		09001-0210-90	O-ring (AL/CFFC)

TORQUE SPECIFICATIONS	
SAE-4M Fittings	60 in-lbs [678 N-cm]
HPRD	90 in-lbs [1017 N-cm]
SAE-8M (Cylinder)	60 FT-lbs [81 N-m]
	*Note: **IN**-lbs vs **FT**-lbs*

Refer to the following MH documents for information on Copper tubing, Fittings and Adapters:

- 5SHDW-0100-00 (High Pressure Copper Tubing and Compression Tube Fittings)
- 5SHDW-0500-00 (High Pressure Adapter Fittings)

DWG NUMBER	5SMAN-002x-00	DWG REV.	C3	DWG SHEET	2 OF 2

p/n: 00MAN-0012-00

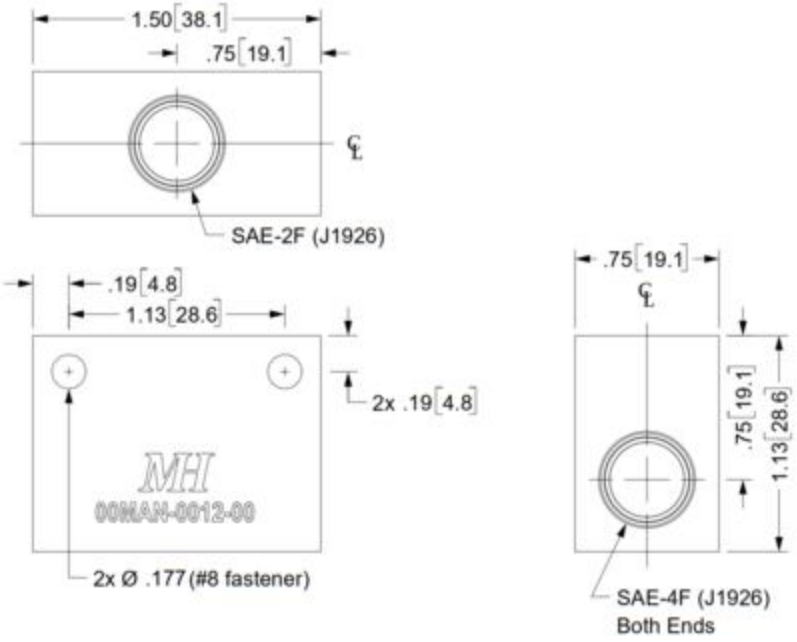
High Pressure Manifold, Tee, SAE -4F x -4F x -4F

Date:

Cleaned for Oxygen Service per MH ESR-008

Aviation Oxygen Systems
MOUNTAIN HIGH
Equipment & Supply Company

REV	ECO	Release	Drawn	REVISION HISTORY
A1	2020-015	2020-06-17	SGO	Product Insert and Customer Drawing



GENERAL SPECIFICATIONS

Material:	UNS A96061 (6061-T6) Aluminum
Weight:	1.5 oz [43 g] (sans fittings and mounting hardware)
Ports:	2x SAE-4F; 1x SAE-2F (J1926)
Test Pressure Rating:	4500 PSI
Temperature Range:	-40°F to 180°F [-40°C to 82°C]

Cleaned for Oxygen Service per MH ESR-008

Compatible fittings, adapters, hoses, etc. are available from Mountain High E&S Company. For high-pressure oxygen connections, MH recommends Copper Tubing and Compression Tube Fittings. MH document # 5SHDW-0100-00 lists common High Pressure Compression Tube fittings; 5SHDW-0500-00 lists additional High Pressure Adapter fittings.

Pipe Fittings are generally not recommended for aviation oxygen systems, but MH does carry a variety of NPT fittings, adapters and manifolds that may be employed as necessary in order to adapt to existing equipment. For low-pressure connections (15-60 PSI regulated oxygen output), MH provides a selection of polyurethane tubing and convenient "One-Touch" fittings.

Contact MH Customer Service for help configuring your oxygen system.

WARNING: Improper installation can result in severe damage, personal injury or death

- *Installation should only be performed by authorized, trained service personnel.*
- *Never work on a pressurized system.*
- *Install fittings to the proper torque specification using proper tools and procedures.*
- *Cleanliness is critical. Contaminants such as oil, unapproved lubricants or cleaning agents, or metal particles, pose an **extreme safety hazard** with the potential of fire or explosion.*
- *Fittings obtained from MH have been cleaned for oxygen service and should not need to be re-cleaned so long as proper hygiene is maintained in the assembly process. Hardware obtained elsewhere (even if the same part) may therefore not be suitable for use in oxygen systems unless it is known for certain that it has been properly cleaned.*

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

THIRD ANGLE PROJECTION

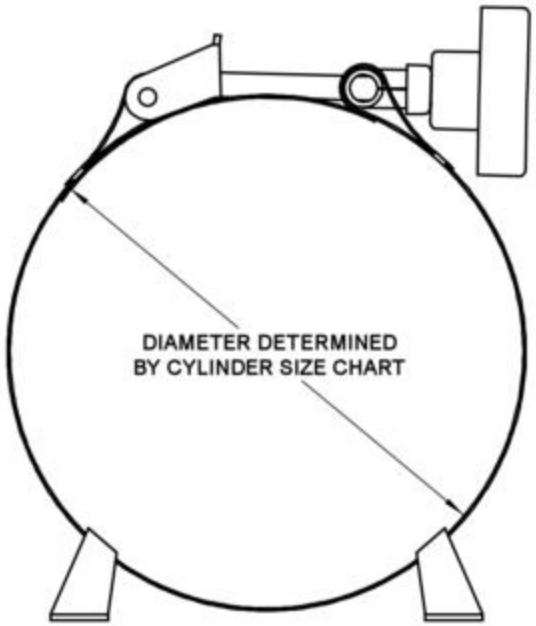
DO NOT SCALE DRAWING

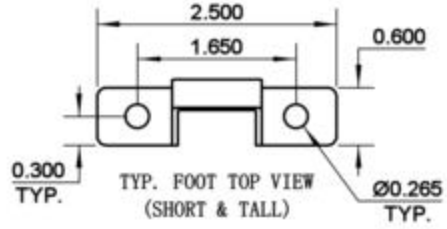
DRAWN	SGO 2020-06-09		
CHECKED			
ENGINEER			
APPROVED			

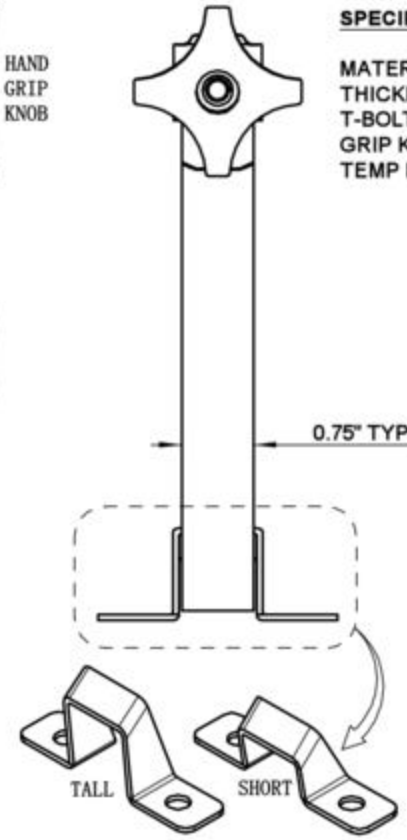
MOUNTAIN HIGH E&S CO.
REDMOND, OR. USA

DWG TITLE	Customer Drawing, High Pressure Manifold, Tee, SAE -4F x -4F x -4F [SCD]				
DWG NUMBER	**5SMAN-0012-00**			DWG REV.	**A1**
CAD FILE	00MAN-0012-00$A1	INV. PART NUMBER	00MAN-0012-00	PROD. NAME	4x4x4 SAE Tee
DWG FORMAT:	ESR-002 Rev H [23]	DWG SCALE		DWG SHEET	1 OF 1
DWG SIZE	A 11x8½				

Insert #: 5IMAN-0012-00

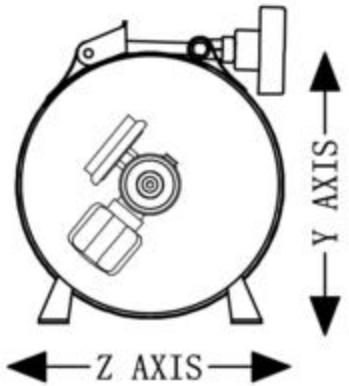






SPECIFICATIONS:

MATERIAL:	STAINLESS STEEL
THICKNESS:	0.025" TYP.
T-BOLT:	1/4-28 UNJF 305 STN. STL.
GRIP KNOB:	PLASTIC W/ 1/4-28 BRASS INSERT
TEMP RANGE:	N/A



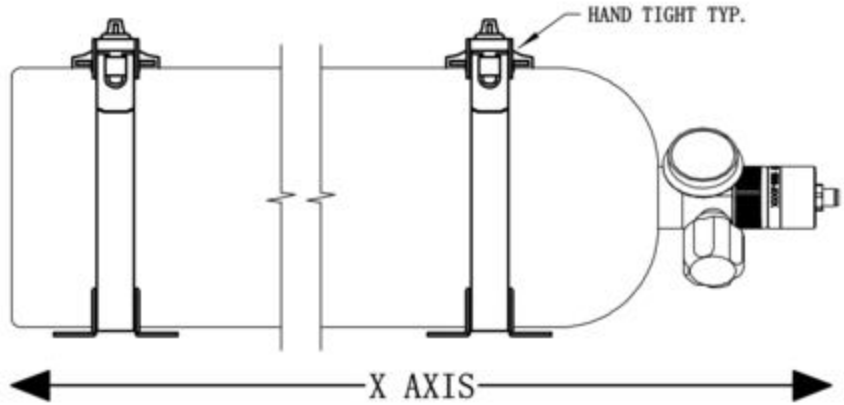
REVISION HISTORY			
REV	ECO NO. YYYY-MM-DD	NAME	NOTES
A	N/A 2000-04-10	PLM	CHANGED TO NEW FORMAT & ADDRESS
B	N/A 2013-08-27	HBS/PLM	REVISED SELECTION CHART
C	2025-034 2025-01-01	KQM	RE-AUTHORED & REVISED SELECTION CHART
D	2025-045 2025-01-01	KQM	ADDED INSERT NUMBER
E	2026-008 2026-03-03	KQM	CORRECTED MOUNTING BRACKET FOOT SIZE

NOTICE:

This "Ω" type cylinder hold-down mounting kit (shown) 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	BAND INSIDE DIAMETER	CYLINDER MOUNTING KIT NUMBER	INCLUDES CUSH BAND?	FOOT SIZE
ALUM.	AL-113, 180	3.25	00CMK-0010-02	NO	SHORT
	AL-248, 415, 682	4.5	00CMK-0016-02	NO	SHORT
	AL-647	5.25	00CMK-0004-02	NO	SHORT
COMPOSITE	CFF-480	4.75	00CMK-0022-03	YES	SHORT
	CFFC-022	5.25	00CMK-0004-03	YES	SHORT
	CFFC-048	7.12	00CMK-0006-03	YES	TALL
	KF-011	3.75	00CMK-0002-03	YES	SHORT
	KF-050	7.12	00CMK-0006-03	YES	TALL
	KF-077	7.75	00CMK-0008-03	YES	TALL
	KF-115	9.25	00CMK-0012-03	YES	TALL

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

THIRD ANGLE PROJECTION

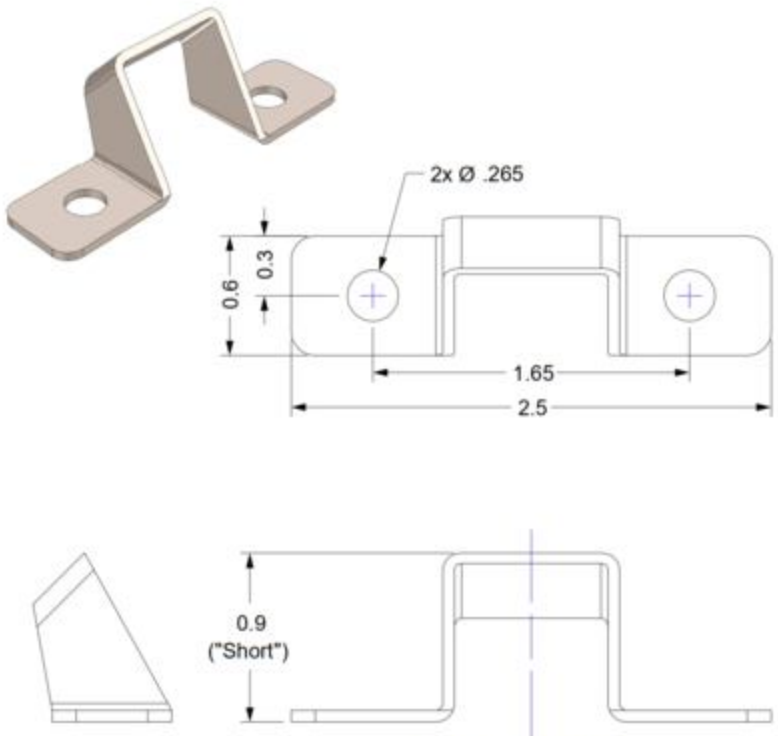
DO NOT SCALE DRAWING

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

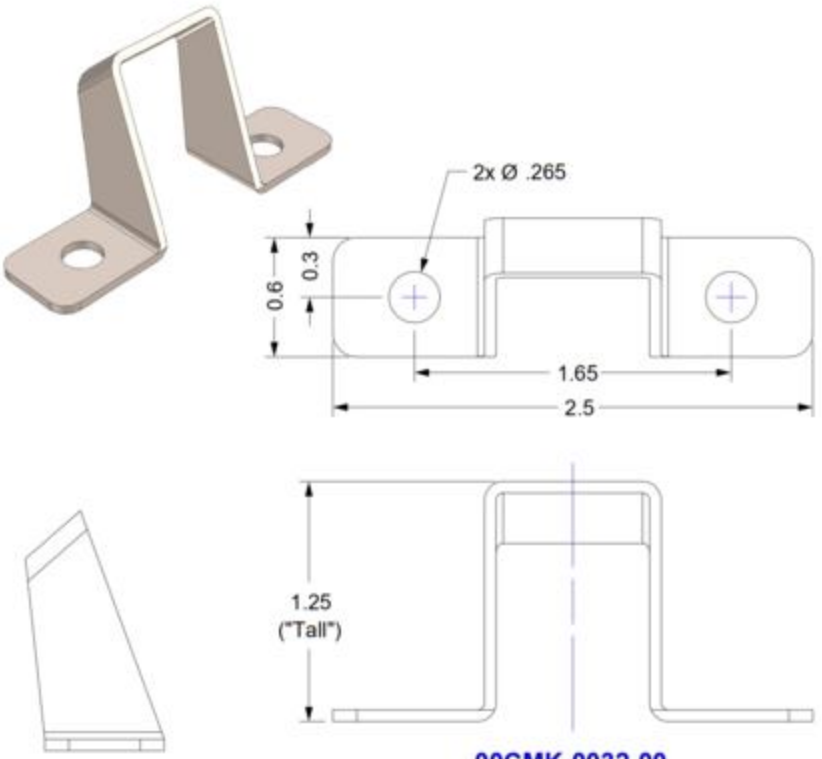
DRAWN	KQM 2025-08-07	DOC TITLE	Cylinder Mounting Kit Chart (SCD)	
CHECKED	EAM 2025-08-08	DOC NUMBER	5SCMK-001-000	DWG REV. E
ENGINEER	JB 2025-08-08	SRCFILE 5SCMK-001-000$E	INV. PART NUMBER n/a	MODEL: CMK
APPROVED	HBS 2025-08-08	DWG FORMAT: ESR-002 Rev H [27]	DWG SCALE NTS	DWG SHEET 1 OF 1 / DWG SIZE A 11x8½

5ICMK-0003-00

REV	ECO	Release	Drawn	REVISION HISTORY
-1	2022-012	2020-03-15	SGO	Customer Drawing



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.
DIMENSIONS IN [ ] ARE MILLIMETERS (REF)
TOLERANCES ARE:
0.X ±0.015 ANGLES ± 3°
0.XX ±0.010 FRACTIONS ± 1/64
0.XXX ±0.005
INTERPRET GD&T PER ASME 14.5
63

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

DRAWN SGO 2022-03-11
CHECKED
ENGINEER
APPROVED

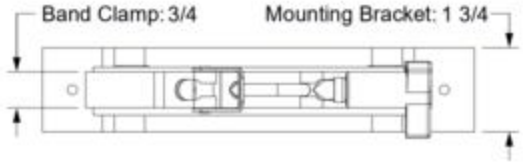
MOUNTAIN HIGH E&S CO.
REDMOND, OR. USA

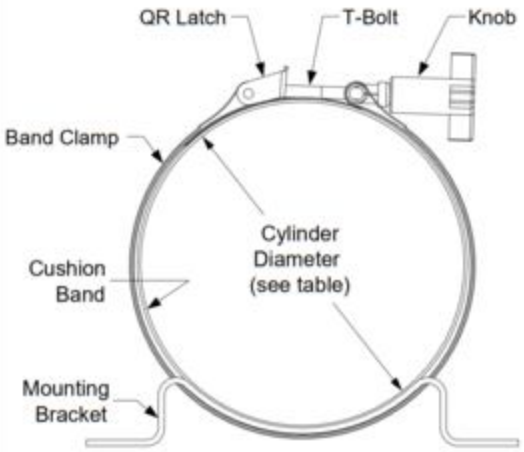
DWG TITLE: Cylinder Mounting Brackets, Omega Style, Short/Tall [SCD]

DWG NUMBER: **5ICMK-0004-00** DWG REV. -1

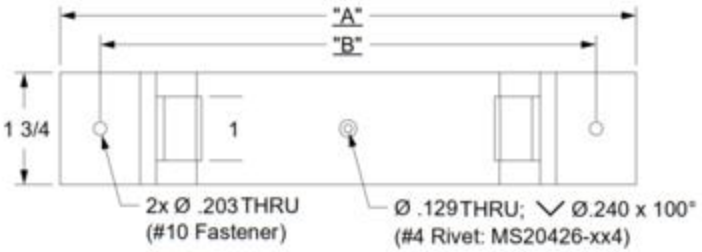
SRC FILE: 00CMK-03x-000$B1
INV. PART NUMBER: 00CMK-0030-00, 00CMK-0032-00
PROD. NAME: CMK-Foot-Short, CMK-Foot-Tall

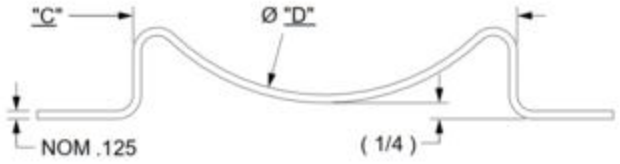
DWG FORMAT: ESR-002 Rev H [27]
DWG SCALE: 1:1
DWG SHEET: 1 OF 1
DWG SIZE: A 11x8½





Cylinder Mounting Kit





Mounting Bracket Dimensions

REVISION HISTORY			
REV	ECO NO. YYYY-MM-DD	NAME	NOTES
-0	2016-036 2016-07-21	SGO	Initial Release
-1	2016-045 2016-08-17	SGO	Correct table entry: 6.8 Cushion Band was 09033-0002-00, is 09033-0003-00
-2	2016-051 2016-09-27	SGO	Omit 7.6" Cylinder Kit; Correct Cylinder Mounting Kit p/n's: 00CMK-1048-03 is 00CMK-0006-13, 00CMK-1115-03 is 00CMK-0012-13

GENERAL SPECIFICATIONS

Weight:	20 oz [56 g]	(per set of 2, p/n 00CMK-0006-13)
Threads:	¼-28 UNJF	(T-Bolt, Knob)

Material

Band Clamp:	300 Series Stainless Steel
Mounting Bracket:	6061-T4 Aluminum

Mounting Hardware

Mounting Bracket:	#10 (or bracket may be drilled out for ¼")
Bracket/Band:	(optional) #4 Rivet (MS20426-xx4)

Cylinder Mounting Kits, Saddle-Bracket Style, QR		
Cylinder Diameter (in.)	6.8	9.1
Applicable Cylinder(s)	CFFC-048, KF-050	KF-115
Cylinder Mounting Kit (p/n)	00CMK-0006-13	00CMK-0012-13
Replacement/Spare Parts (p/n):		
Band Clamp	00CMK-0055-02	00CMK-0072-02
Knob	00CMK-0036-00	00CMK-0036-00
Cushion Band	09033-0003-00	09033-0004-00
Mounting Bracket	00CMB-0048-00	00CMB-0115-00
Mounting Bracket Dimensions (in.):		
"A" = Bracket OAL	9	10
"B" = Mounting Hole Spacing	7.75	9
"C" = Saddle Width	6	7.5
"D" = Saddle Diameter	6.85	9.15

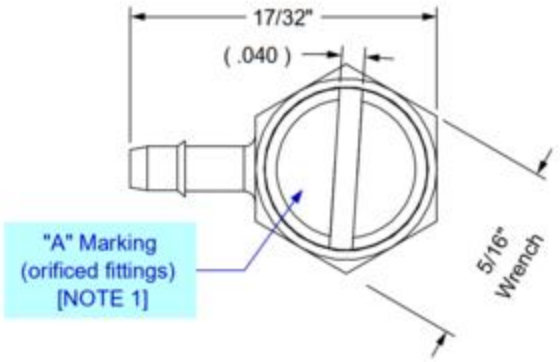
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES. TOLERANCES ARE:
0.X ±0.015
0.XX ±0.010
0.XXX ±0.005
ANGLES ± 3°
FRACTIONS ± 1/64
INTERPRET GD&T PER ASME 14.5
63

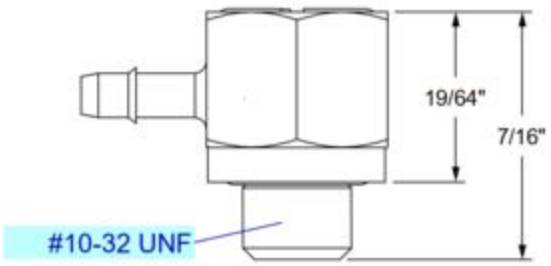
THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

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

DRAWN	SGO 2016-07-14	DWG TITLE	Cylinder Mounting Kits, Saddle-Bracket Style, QR [SCD]		
CHECKED	EAM 2016-07-21	DWG NUMBER	5ICMK-0006-00	DWG REV.	-2
ENGINEER	TD 2016-07-21	CAD FILE	INV. PART NUMBER 00CMK-0006-13 00CMK-0012-13	PRODUCT NAME	
APPROVED	HBS 2016-07-21	DWG FORMAT: ESR-002 Rev H [16]	DWG SCALE	DWG SHEET 1 OF 1	DWG SIZE A





REV	ECO	Release	Drawn	REVISION HISTORY
-0	2017-003	2/8/2017	SGO	Customer Drawing
-1	2025-058	12/2/2025	KQM	Removed EPDM O-Rings, will use Silicone only

GENERAL SPECIFICATIONS

Material:	Body/Stud:	Brass
	O-rings:	(see table)
Weight:	.15 oz [4 g]	
Thread:	#10-32 UNF	
Hose-barb:	1/16 ID [1/8 OD] tubing	
Orifice:	***[NOTE 1]***	
Pressure Rating:	100 psi MAX ***[NOTE 2]***	
Temp Range:	-50°F to +130°F [-45°C to +55°C]	
Clean:	For Oxygen Service	

NOTES:

[1] "-01" Fittings include an orifice. Relevant applications would typically include one orificed Fitting. Orificed Fittings should have a letter "A" stamped on the face of the Stud, and the associated port should also be stamped "A".

[2] Max Pressure rating is for Brass Fitting only. Effective system pressure capability would generally be limited by the type of tubing used, and whether the tubing is additionally secured by some form of tubing clamp.

MH Part Numbers

O-Ring Material	Banjo Fitting Assembly	Replacement Top O-ring	Replacement Bottom O-ring
Silicone	19055-1002-0x	09001-1014-70	09001-1516-70

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 2017-02-07
CHECKED EAM 2017-02-08
ENGINEER PLM 2017-02-08
APPROVED HBS 2017-02-08

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

DWG TITLE: Banjo Fittings, #10-32 x 1/16 ID Tube Barb [SCD]
DWG NUMBER: **5SBNJ-002-100**
DWG REV: -1
CAD FILE: 5SBNJ-002-100$-1
INV. PART NUMBER: 19055-x002-0x
PROD. NAME:
DWG FORMAT: ESR-002 Rev H [20]
DWG SCALE:
DWG SHEET: 1 OF 2
DWG SIZE: A 11x8½

Insert #: 5IBNJ-1002-00

O-Ring Replacement

O-rings may be replaced in the event of damage, or to upgrade existing fittings. See Parts Table on Sheet 1 for replacement O-ring part numbers.

Banjo Fitting consists of 4 parts (as illustrated):
(1) Bottom (large) O-ring (seals between Body and port mating-surface)
(2) Banjo Body (with hose-barb)
(3) Top (small) O-ring (seals between Stud and Body)
(4) Threaded Stud (secures Body to threaded port)

Disassembly

It is important to maintain cleanliness and not contaminate the oxygen system. Keep oil, grease or other petroleum products away from oxygen equipment.

Tubing does not necessarily need to be removed from Fitting prior to disassembly in order to replace O-rings. If tubing must be removed, take care not to damage hose-barb rib, otherwise Fitting may leak. If replacing orificed and non-orificed Fittings at the same time, be certain that orificed Fitting is installed back into correct port.

Unscrew Stud until Fitting is disengaged from port. Withdraw Stud from Body and remove O-rings.

Reassembly

Care is required in re-assembly to avoid contaminating the system or damaging the O-rings, Stud, or hose-barb.

O-rings may be lightly lubed with Christo-Lube or other oxygen-compatible product if preferred.

If tubing has been removed or is being replaced, it may be attached to Banjo Body hose-barb either before or after assembling the Banjo Fitting, as convenient.

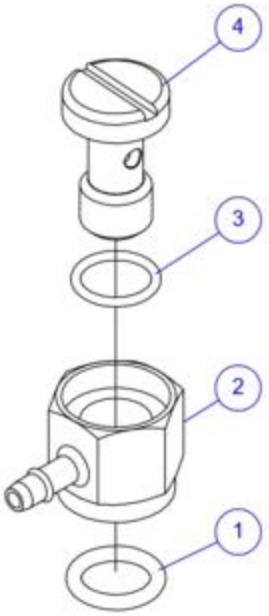
1. Carefully slip the Top O-ring over the threads of the Stud and seat the O-ring into the groove under the head of the Stud.

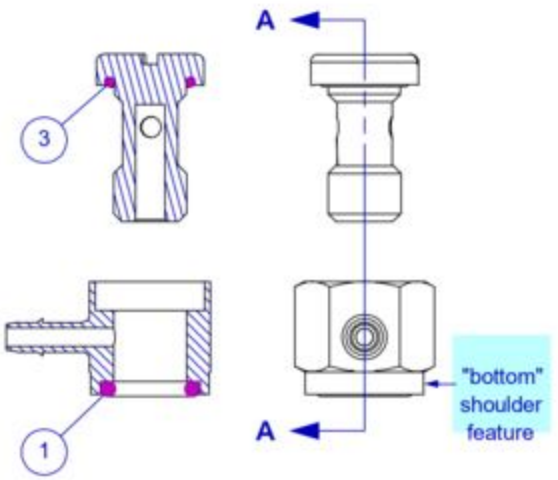
2. Insert the Stud through the "top" of the Body ("top" and "bottom" may be determined by locating the cylindrical shoulder feature which identifies "bottom")

3. Seat Bottom O-ring into "bottom" of Banjo Body.

4. Install the assembled fitting into the threaded port and turn the stud until the threads are fully engaged. Adjust the fitting to the desired orientation before tightening.

5. Torque Stud to 7 in-lbs. The Bottom O-ring will be compressed until the Body contacts the port mating-surface "metal-to-metal". At this point a firm stop should be felt if tightening by hand. Do not attempt to tighten any further beyond this point as the Stud could be stripped or broken off.





REF	Description
1	Bottom O-ring
2	Banjo Body
3	Top O-ring
4	Stud

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

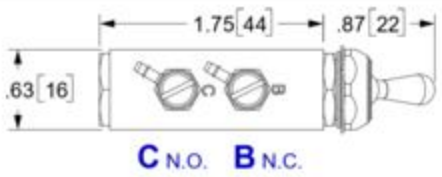
DO NOT SCALE DRAWING

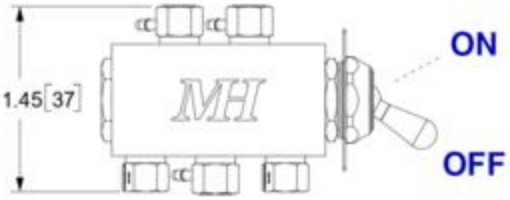
MOUNTAIN HIGH E&S CO.
REDMOND, OR. USA

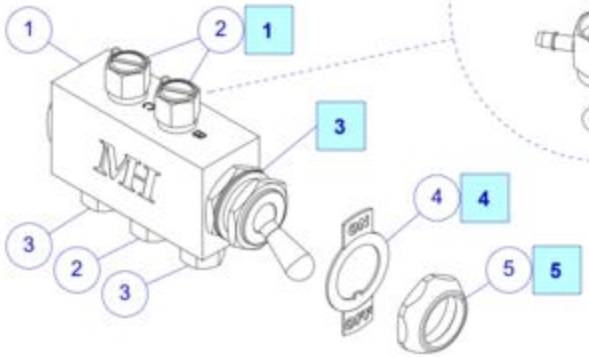
DRAWN	SGO 2017-02-07	DWG TITLE	Banjo Fittings, #10-32 x 1/16 ID Tube Barb [SCD]		
CHECKED	EAM 2017-02-08	DWG NUMBER	5SBNJ-002-100	DWG REV.	-1
ENGINEER	PLM 2017-02-08	CAD FILE	5SBNJ-002-100$-1	INV. PART NUMBER	19055-x002-0x
APPROVED	HBS 2017-02-08	DWG FORMAT:	ESR-002 Rev H [20]	DWG SCALE	
PROD. NAME		DWG SHEET	2 OF 2	DWG SIZE	A 11x8½

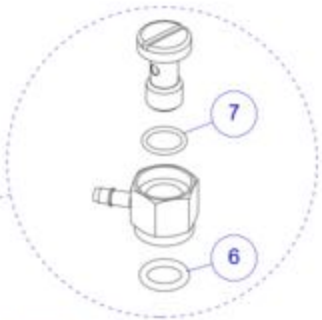
Insert #: 5IBNJ-1002-00

REV	ECO	Release	Drawn	REVISION HISTORY
B3	2020-024	2020-07-31	SGO	Customer Drawing









Key

1 Item #

1 Note

GENERAL SPECIFICATIONS

Material:	Brass, Stainless Steel
Weight:	4.6 oz [130 g]
Mounting Hole:	Ø.500[½"]; 12mm
Mounting Thread:	15/32-32 UNS
Control Ports:	#10-32 UNF
Pressure Rating:	150 PSIG MAX
Temp Range:	-15°F to +400°F [-29°C to +204°C]

Notes

[1] Banjo-style tube-barb fittings (Item 2) may be reoriented as required. Loosen top portion of fitting with standard screwdriver, adjust orientation and re-tighten. Hex flats are 5/16" wrench size.

[2] Connect pneumatic control switch to regulator as shown in table using 1/8" OD PolyUrethane tubing Items (8)(9)(10).

[3] Jam nut is optional in accordance with requirements and space available. Two lockwashers are supplied with switch.

[4] As required, install Switch Plate (4) and orient "ON/OFF" legend as shown to maintain concordance with regulator operation.

[5] Dress Nut (5) may be installed as preferred.

6. Spare/replacement parts may be ordered separately from MH per the part numbers indicated. Tubing (Items 8, 9, 10 not shown) is ordered by the foot.

2

Regulator Connection		
Tubing Color	Regulator Port	Switch Port
Yellow	"A"	"A"
Orange	"B"	"B"
Gray	"C"	"C"

Pneumatic Valve Kits	
MH p/n	Description
APCR0-0117-00	Valve and all fittings as shown
APCR0-0118-00	Valve and all fittings as shown plus 20 ft each of items (8)(9)(10) PolyUrethane Tubing

Replacement parts		
Item	Part Number	Description
1	19026-0007-01	Pneumatic Valve/Switch
2	19055-1002-00	Banjo Fitting
3	09025-0023-00	Breather
4	50001-0003-00	Switch Plate, "On/Off"
5	19027-0006-00	Dress Nut
6	09001-1516-70	O-ring, Banjo Body, Silicone
7	09001-1014-70	O-ring, Banjo Stud, Silicone
8	19600-0005-00	PolyUrethane Tubing, 1/8" OD, Yellow [Order Qty: Feet]
9	19600-0007-00	PolyUrethane Tubing, 1/8" OD, Gray [Order Qty: Feet]
10	19600-0006-00	PolyUrethane Tubing, 1/8" OD, Orange [Order Qty: Feet]

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

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

DRAWN SGO 2020-07-21
CHECKED
ENGINEER
APPROVED

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

DWG TITLE: Customer Drawing, Pneumatic Valve, 4-way [SCD]

DWG NUMBER: **5ICR0-0118-00** DWG REV. **B3**

CAD FILE: APCR0-0117-00$-0 | INV. PART NUMBER: APCR0-0117-00 APCR0-0118-00 | PROD. NAME: PCR 4-Way Switch Kit

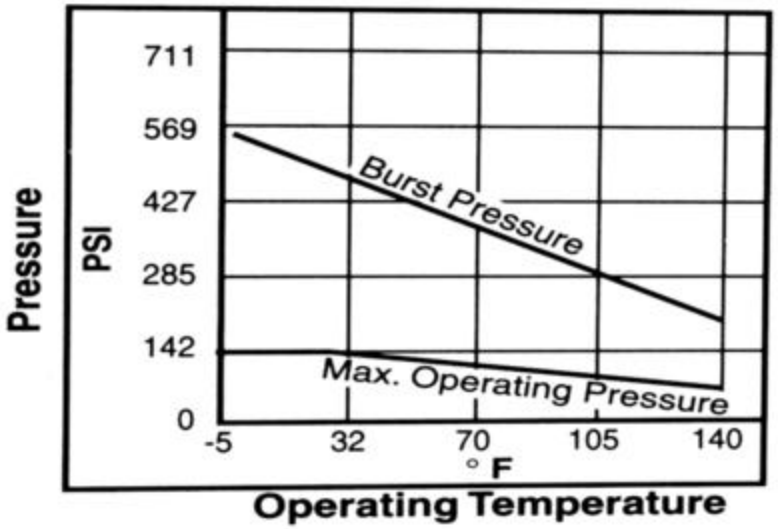
DWG FORMAT: ESR-002 Rev H [23] | DWG SCALE | DWG SHEET 1 OF 1 | DWG SIZE A 11x8½

Insert #: 5ICR0-0118-00

5I930-0001-00

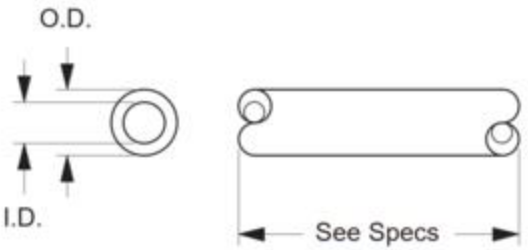
REVISION HISTORY			
REV	DA-MO-YR	E. C. O. / APPR.	NOTES
A	04-07-00	PLM	CHANGED TO NEW FORMAT & ADDRESS
B	17-04-13	PLM	ADDED IMAGES
C	18-08-14	PLM	ADDED DUROMETR COLUMN
D	2019-12-03	SGO	Dwg# was E-930005, is 5I930-0001-00; Add O2 compatibility info

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
OXYGEN COMPATIBILITY:	YES



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 ± 0.5° FRACTIONS ± 1/64
0.XX ±0.010
0.XXX ±0.005
63
INTERPRET GD&T DIMS AND TOLS PER ASME 14.5

THIRD ANGLE PROJECTION.

<CR> KEY CHARACTERISTICS
<MA> PER CORP. DOC: ESR-001

NO. -

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. #: 5I930-0001-00 REV D

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

Insert # 5I930-0001-00

REV	ECO	Release	Drawn	REVISION HISTORY
-3	2019-023	2019-05-28	SGO	Customer Drawing

High Pressure Copper Tubing and Compression Tube Fittings

This application note provides information about High Pressure Copper Tubing and Compression Tube Fittings available from Mountain High Equipment & Supply (MH) for use in aviation oxygen systems, as well as general procedures and guidelines for Copper Tubing preparation and Compression Tube Fitting assembly and installation.

Copper Tubing - GENERAL SPECIFICATIONS

Material: UNS C12200, ASTM-B68 (99.9% Cu, 0.02% P)

Working Pressure Rating: 3074 PSIG @ 100°F
Temperature Range: -25°F to 125°F [-32°C to 52°C]

Package: Coiled Roll, 1-foot increments, Cleaned & Capped or Crimped

MH p/n	Description
19605-0002-00	1/8 inch OD, Soft Copper Tubing Bulk (per ft.)
19606-0003-00	3/16 inch OD, Hard-Drawn Copper Tubing Bulk (per ft.)

1/8" OD Soft Copper Tubing

MH Item #: **19605-0002-00**

OD: 1/8" (.125") [3.175 mm]
ID: 0.065" [1..651 mm]
Wall Thickness: 0.030" [0.762 mm]
Weight: 0.035 Lbs / Ft [0.052 Kg / m]

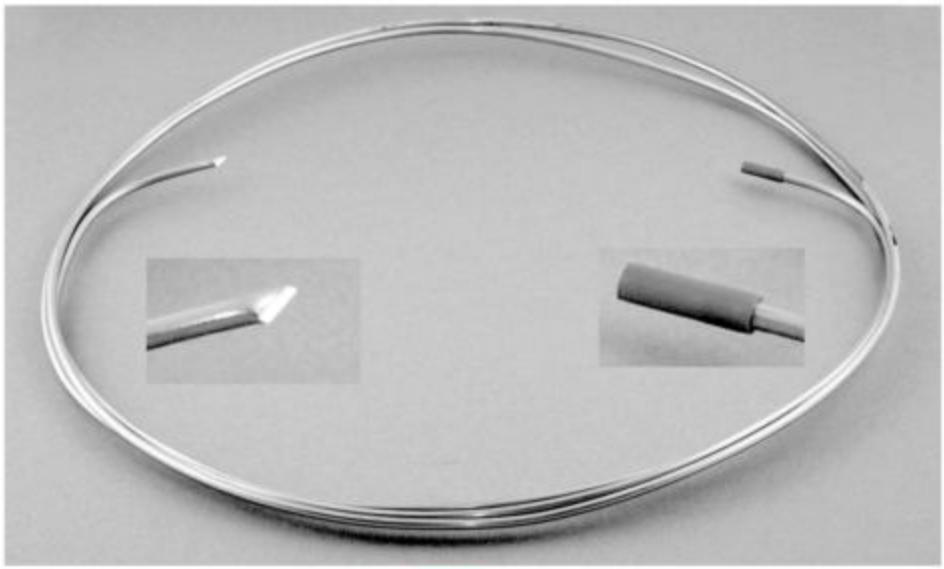
Cleaned for Oxygen Service per MH ESR-008

3/16" OD Hard-Drawn Copper Tubing

MH Item #: **19606-0003-00**

OD: 3/16" (0.1875") [4.763 mm]
ID: 0.1275" [3.329 mm]
Wall Thickness: 0.030" [0.762 mm]
Weight: 0.058 Lbs / Ft [0.085 Kg / m]

Cleaned for Oxygen Service per MH ESR-008



Packaging

Copper tubing is sold by the foot and unless otherwise specified will be shipped in a 12" dia. coil with the ends either crimped (left inset) or capped (right inset) or capped *and* crimped.

Contact Mountain High E&S for special packaging.

References

For more information about hardware and accessories available from MH:

- 5SHDW-0100-00
  High Pressure Copper Tubing and Compression Tube Fittings
- 5SHDW-0300-00
  High Pressure NPT Pipe Fittings
- 5SHDW-0500-00
  High Pressure Adapter Fittings

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES. TOLERANCES ARE:
0.X ± .015
0.XX ± .010
0.XXX ± .005
ANGLES ± 3°
FRACTIONS ± 1/64
63
INTERPRET GD&T PER ASME 14.5

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

DRAWN	SGO	2017-03-07
CHECKED	EAM	2017-03-15
ENGINEER	PLM	2017-03-16
APPROVED	HBS	2017-03-16

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

DWG TITLE: High Pressure Copper Tubing and Compression Tube Fittings [SCD]
DWG NUMBER: **5SHDW-0100-00**
DWG REV.: -3
CAD FILE: 5SHDW-0100-00$-3
INV. PART NUMBER: 00HDW-0xxx-xx
PROD. NAME:
DWG FORMAT: ESR-002 Rev H [20]
DWG SCALE:
DWG SHEET: 1 OF 4
DWG SIZE: A 8½x11

Insert #: 5IHDW-0100-00

Copper Tubing

Copper tubing supplied by Mountain High Equipment & Supply (MH) is warranted as "cleaned for oxygen service" provided both ends are sealed, crimped or capped.

Handling

Handle copper tubing carefully as scratches or burrs on the tubing could interfere with sealing. Pinched or out-of-round tubing may not fit the ID of the Ferrules or Body bore and could also lead to leakage.

Cutting

Copper tubing should be cut with a fine-tooth saw (jeweler's coping saw) with at least 32 teeth per inch in order to minimize residual burrs. Use a cut-off guide or miter-box to assure a square cutoff.

Use of a conventional tubing cutter is not recommended as it will result in a reduced inner diameter as well as a slight flare at the outer diameter. The reduction in inner diameter can be as much as 50% which would compromise proper oxygen flow. The tube opening must therefore be restored to the original inner diameter with a drill bit or a small jeweler's reamer. The flared outer diameter may also need to be corrected as it may interfere with assembly and the proper seating of the tubing in the fitting body.

Deburring

Remove burrs from the cut end of the tubing. Burrs on the ID of the tubing can restrict flow or break loose and clog or damage the oxygen system, and pose a ***safety hazard*** (see ***"Cleaning"***). Burrs on the OD of the tubing can interfere with the proper seating of the tubing in the fitting body. Do not over-deburr the OD of the tubing.

Tubing must be purged prior to assembly in order to remove any metal particles that could contaminate the system.

Cleaning

High pressure oxygen systems must be free of grease, oil or other unapproved lubricants or cleaning agents, as well as any metal particles. Such contaminants, aside from having the potential to clog or damage critical orifices or filters in the system, pose an ***extreme safety hazard*** with the potential of fire or explosion. Therefore, cleanliness in the preparation and assembly of oxygen system components is critical.

Tubing used in oxygen systems must be examined internally just prior to final assembly and re-cleaned if necessary (NFPA 99). FAA Advisory Circular **AC 43.13-2B** also specifies the cleaning of oxygen lines and fittings that have not been previously cleaned and sealed and lists several approved methods for doing so (Paragraph 608d),

Tubing and Fittings obtained from MH have been cleaned for oxygen service and should not need to be re-cleaned so long as proper hygiene has been maintained in the assembly process. Tubing and Fittings obtained elsewhere (even if the *same* part) may therefore not be suitable for use in oxygen systems unless it is known for certain that they have been properly cleaned.

Purging

Just prior to final assembly to any associated equipment, tubing must be purged with air to remove any contaminants. Contaminants include not only metal particles generated in tubing preparation, but any cleaning fluid residue that may be present from previous cleaning procedures.

Use clean, dry compressed air to purge system tubing and fittings as required. Introduce the air in such a way that any contaminants present are completely ejected from the system rather than displaced into adjacent components.

Caution: Conventional "Shop Air" systems may have lubricating oil introduced into the system and therefore would not be suitable for the purging of oxygen system components.

Jeweler's Saw - Preferred

Tubing Cutter - Not Recommended

Compression Tube Fittings - GENERAL SPECIFICATIONS

Material: UNS C36000 (CDA-360) Brass
Pressure Rating: 3300 PSIG Working Pressure
Temp Range: -50°F to +130°F [-45°C to +55°C]

Cleaned for Oxygen Service

Compression Tube Fittings									
MH p/n	Fitting	Tube OD	Thread	Weight Oz. [g]	Dim "A"	Dim "B"	Wrench "W1"	Wrench "W2"	Fig.
00HDW-0104-00	Straight	1/8	5/16-24 UNF (SAE-2M)	0.44 [13]	1.18 [30.0]		7/16	7/16	1A
00HDW-0108-00	Straight	1/8	7/16-20 UNF (SAE-4M)	0.88 [25]	1.24 [31.5]		7/16	9/16	1A
00HDW-0108-05	Straight (w/ filter)	1/8	7/16-20 UNF (SAE-4M)	0.90 [26]	1.24 [31.5]		7/16	9/16	1A
00HDW-0110-00	Straight	3/16	7/16-20 UNF (SAE-4M)	0.98 [28]	1.30 [33.0]		1/2	9/16	1A
00HDW-0110-05	Straight (w/ filter)	3/16	7/16-20 UNF (SAE-4M)	1.00 [28]	1.30 [33.0]		1/2	9/16	1A
00HDW-0118-00	Straight	1/8	1/8-27 MNPT	0.64 [18]	1.20 [30.5]		7/16	7/16	1B
00HDW-0120-00	Straight	1/8	1/8-27 FNPT	0.81 [23]	1.13 [28.7]		7/16	9/16	1C
00HDW-0122-00	Straight	3/16	1/8-27 MNPT	0.69 [20]	1.23 [31.2]		1/2	7/16	1B
00HDW-0124-00	Straight	3/16	1/8-27 FNPT	0.89 [25]	1.17 [29.7]		1/2	9/16	1C
00HDW-0134-00	Straight	1/8	1/4-18 MNPT	0.99 [28]	1.40 [35.6]		7/16	9/16	1B
00HDW-0138-00	Straight	3/16	1/4-18 MNPT	1.23 [35]	1.43 [36.3]		1/2	9/16	1B
00HDW-0145-00	Straight	3/16	1/4-18 FNPT	1.58 [45]	1.35 [34.3]		1/2	3/4	1C
00HDW-0150-00	Elbow	1/8	1/8-27 MNPT	0.88 [25]	.93 [23.6]	.70 [17.8]	7/16	---	2A
00HDW-0152-00	Elbow	1/8	1/8-27 FNPT	1.48 [42]	.97 [24.6]	.75 [19.0]	7/16	---	2B
00HDW-0174-00	Union	1/8	---	0.80 [23]	1.40 [35.6]		7/16	7/16	3
00HDW-0176-00	Union	3/16	---	1.00 [28]	1.47 [37.3]		1/2	7/16	3
00HDW-0182-00	Bulkhead Union	1/8	---	1.15 [33]	2.02 [51.3]		7/16	1/2	4
00HDW-0204-00	Tee	1/8	---	1.32 [37]	1.76 [44.7]	.88 [22.4]	7/16	---	5
00HDW-0206-00	Tee	3/16	---	1.84 [52]	1.92 [48.8]	.96 [24.4]	1/2	---	5

Compression Fittings Spare Parts	MH Part Number	
	1/8 OD Tube	3/16 OD Tube
Ferrule and Nut Set, Brass	00HDW-0212-00	00HDW-0214-00
Back Ferrule, Brass	00HDW-0212-BB	00HDW-0214-BB
Front Ferrule, Brass	00HDW-0212-FB	00HDW-0214-FB
Nut, Brass	00HDW-0212-NB	00HDW-0214-NB

Spare/replacement O-Ring for SAE-4M port-adapter fittings	
Part Number	**Description**
09001-3904-70	O-ring, EPDM, 3-904 (SAE-4), E70

(Applies to MH p/n's 00HDW-0108-xx, 00HDW-0110-xx [Fig 1A])

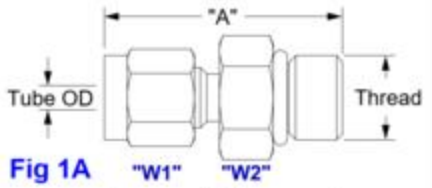


Fig 1A

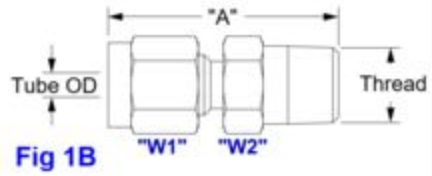


Fig 1B

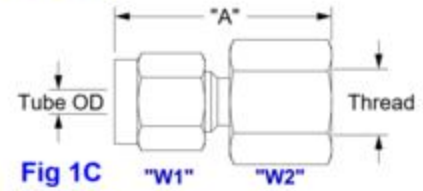


Fig 1C

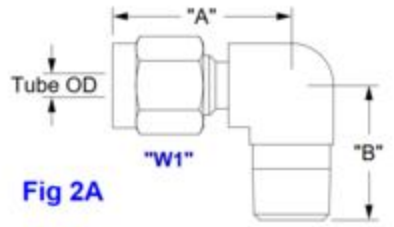


Fig 2A

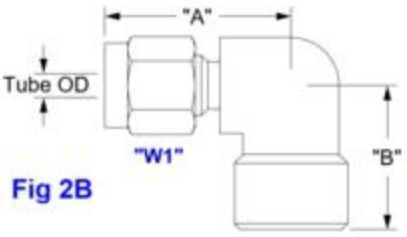


Fig 2B

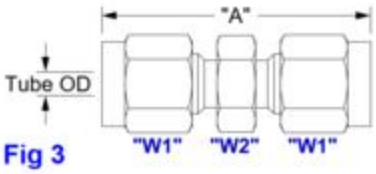


Fig 3

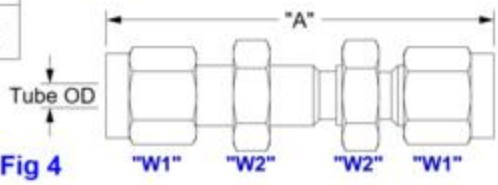


Fig 4

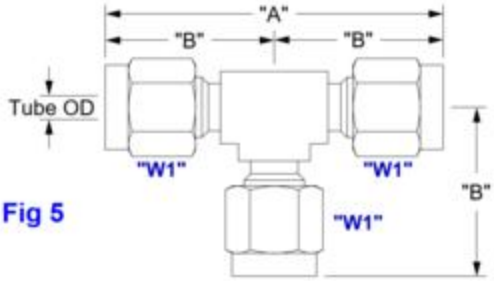


Fig 5

DWG NUMBER	5SHDW-0100-00	DWG REV.	-3	DWG SHEET	3 OF 4

Insert #: 5IHDW-0100-00

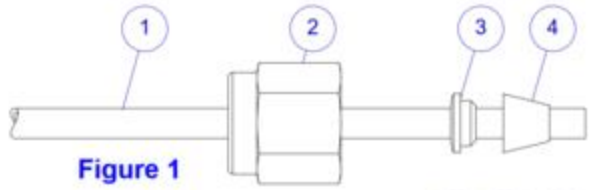


Figure 1

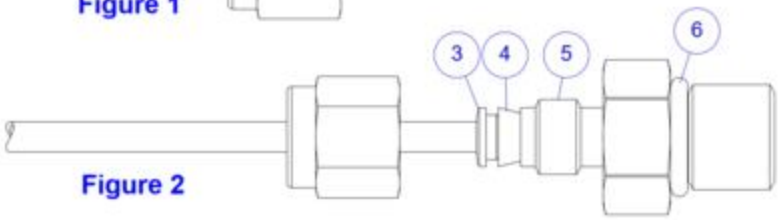


Figure 2

REF	Description
1	Copper Tubing
2	Nut
3	Back Ferrule
4	Front Ferrule
5	Tube-Fitting Body
6	O-Ring

Compression Fitting Assembly

The following instructions are applicable to all 1/16", 1/8" and 3/16" OD Compression Tube Fittings available from MH.

Note: Illustration depicts SAE-4M port-adapter fitting (O-ring applies only to this type of fitting)

Note: Threaded port-adapter fittings (SAE, NPT) must be installed into the port before the tubing connection is made

Note: Apply oxygen-compatible Teflon tape (e.g., MIL-SPEC T27730A) to NPT threads prior to installation (see 5SHDW-0300-00 "High Pressure NPT Pipe Fittings" for more information on installation of NPT fittings)

1) Remove the Nut from the Compression Tube Fitting and retain the 2 Ferrules

2) Slide the Nut and 2 Ferrules over the end of the Tubing in the same order and orientation as shown [Figure 1]

3) Push the Tubing into the fitting Body until the Tubing bottoms-out on the internal shoulder [Figure 2]

4) Push the 2 Ferrules down against the fitting Body and turn the Nut to finger-tight, making sure that the Tubing remains seated against the shoulder and does not back out

5) Holding the fitting Body steady, use a wrench to turn the Nut an additional 3/4 turn (turn the Nut only, not the Body)

Note: Rather than removing the Nut and disassembling the Fitting, it may be possible to merely loosen the Nut and push the Tubing through the Ferrules and into the Fitting until it bottoms-out on the shoulder. Turn the Nut finger-tight, and then an additional 3/4 turn.

Re-assembly

Connections may be disassembled and reassembled as required, but re-assembly is subject to a different procedure. Initial assembly swages the Ferrules onto the Copper Tubing, and reassembling the connection with the same procedure (3/4 turn) would ***over-compress the Tubing and Ferrules and compromise the connection.***

Caution: Always depressurize the system before disassembly

1) Before disassembly, mark the Tube at the back of the Nut, and also mark a line across the flats of the Nut and fitting Body. These reference lines will be used to confirm that the Tube has been fully seated and that the Nut has been returned to it's previous pulled-up position upon re-assembly.

2) Disassemble the fitting and make changes or adjustments as required

3) Re-insert the Tube (with pre-swaged Ferrules) into the Fitting until the front Ferrule seats against the fitting Body [Figure 2]. Engage the Nut and turn to finger-tight. Hold the fitting Body steady and turn the Nut with a wrench to the previous pulled-up position using the marks made prior to disassembly as references. There should be a significant increase in resistance at this point. Further tighten the Nut slightly.

Note: If the Tubing is being shortened and the pre-swaged Ferrules are cut off, then follow the directions for initial assembly. Cut, deburr and purge the tubing as previously directed. Do not attempt to re-use the previously swaged Ferrules - replacement Ferrules are available from MH. The Nut may be re-used.

HP/HF Regulator

Model 310-206H
p/n 00REG-1091-01

REV	ECO	Release	Drawn	REVISION HISTORY
-0	2022-033	2022-11-07	SGO	Customer Drawing - Insert

GENERAL SPECIFICATIONS

Inlet Pressure Rating: 3000 PSI MAX

HP/HF Output (per customer specifications):

_____ psi (Dynamic)

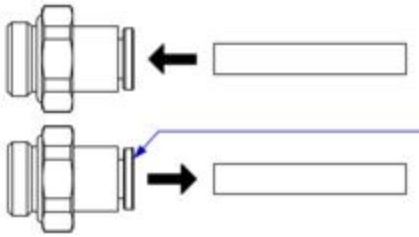
_____ psi (Static)

_____ L/min (Average Open Flow Rate)

Weight: 2.3 Oz. [64 g]

See also: MH document 5SREG-310-xxx

OUTLET TUBING CONNECTION - 4mm/6mm Push-To-Connect Fittings



INSERTING
Push in the tubing

REMOVING
1. Push in the connector collar
2. Pull the tube straight back while holding the collar in

To INSERT TUBING: Push the tubing into the connector until resistance is felt, **then push a little further, about 1/8 inch [3 mm].** Gently tug on the tubing to make sure it is captured.

To REMOVE TUBING: Push the tubing in slightly, then push in the connector collar while pulling gently on the tubing.

When removing tubing, ***DO NOT pull on the tubing without pushing in the collar,*** as this will likely damage the connector.

Installing the Regulator

Thread the regulator into the SAE-4F port of the RCV/RCR unit or Manifold where you wish to install the regulator and torque to **60 in-lbs.**

Connect the outlet tubing to the remainder of your oxygen system.

Open the cylinder valve ***SLOWLY*** (~ 2 turns).

Removing the Regulator

DO NOT ATTEMPT TO REMOVE REGULATOR WHILE UNDER PRESSURE

Bleed-off internal pressure by first ***closing the main cylinder valve*** and then disconnecting the outlet tubing from the regulator.

The regulator can now be removed.

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

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

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

DRAWN SGO 2022-09-27	DWG TITLE	MH 3G Regulator, Single-Stage, NO-Gauge, SAE-4M x 6mm Axial Tube (HP/HF) [Insert]			
CHECKED EAM 2022-11-04	DWG NUMBER	**5IREG-1091-01**			DWG REV. **-0**
ENGINEER JB 2022-11-04	SRC FILE	00REG-310-xxx$-0	INV. PART NUMBER	00REG-1091-01	PROD. NAME
APPROVED HBS 2022-11-07	DWG FORMAT: ESR-002 Rev H [27]	DWG SCALE	DWG SHEET 1 OF 1		DWG SIZE A 11x8½

Insert #: 5IREG-1091-01

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS (servicing intervals):

EVERY 6 MONTHS:

- Verify delivery masks and cannulas are clean and unsoiled. Periodic replacement is recommended, because even with the best cleaning efforts, bacteria and such can contaminate the mask and pose a health risk.

ANNUALLY:

- Verify cylinder pressure is holding when closed.
- If the system is unused for an extended period of time, verify operation of the RCV, pilot regulator, service regulator, and delivery equipment.
- Recommended replacement of batteries in EDS unit(s) if used.

EVERY (2) YEARS:

- Recommended service of EDS unit(s),if used.

EVERY (5) YEARS:

- Hydrostatic test of cylinder.
- Recommended service of RCV and regulators.
- Trim all tubing ends ≈1/8" - 1/4" that are installed in one-touch fittings.
- If using an electrical gauge, verify that it matches pneumatic gauges at the fill station (if used), within 150psi.

EVERY (10) YEARS:

- Recommended fill-station service if used.
- Check for degredation of all polyurethane tubing and replace as needed.

RCV-2D(L/P) SERVICING DETAILS:

The service interval for the RCV is predicated on, among many factors, the time between service and frequency of use, i.e. number of on/off cycles the RCV endures between servicing. A good rule of thumb is to plan on sending the RCV in for servicing every (5) years. This coincides with the hydrostatic testing requirement for DOT cylinders (every 5 years), and most owners have the RCV serviced at the same time for convenience. The RCV should be sent to Mountain High Oxygen for service, as should any other components within the system that require repair.

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

The main service 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 ~ 70 - 80 psig. The LPRD will relieve the over pressure supply to ambient.

SECTION 7: SPECIFICATIONS QUICK REFERENCE

GENERAL SPECIFICATIONS:

Weight (RCV-2D & 2DL standard config.):	20.5 oz. (581.2 g) with one main regulator unit, standard fittings, & wire harness
Dimensions (RCV-2D & 2DL):	See Form Factor Detail (Page 13)
Weight (RCV-2DP standard config.):	27.5 oz. (780 g) with one main regulator unit, standard fittings, & switch kit w/ tubing
Dimensions (RCV-2DP):	See Form Factor Detail (Page 14)
Operating Voltage for the electro-pneumatic valve internal to the RCV-2D & 2DL:	12 ~ 24 volts (Min. 11VDC, Max. 28VDC). Note: Power on/off actuation results in a ≈350 ma. current pulse for ≈25 milliseconds. Then settles to < 50 ma. from the indicator LED.
RCV Max. allowable leakage (Air):	≈ 0.01 cc / Hr.

Test condition with RCV-2D and one main regulator (applies to all versions)

HPRD (High pressure relief device):	165°F fusible metal and burst disc for 124 bar (1,800 psig.) service (or as required)
Number of primary ports (unvalved, direct or wild):	3 (three)
Primary port type:	O-ring type seal SAE-4-F (7/16-20 UNF 2B)
Number of secondary ports (controlled by valve):	3 (three)
Secondary port type:	O-ring type seal SAE-4-F (7/16-20 UNF 2B)

Operational (All Versions)

Operating inlet pressure (full cycle):	≈193 bar (2,800 psig.) @ operating temp
Nominal operating inlet pressure:	≈138 bar (2,000 psig.) @ operating temp
Inlet pressure range for pilot regulator:	≈3 to 207 bar (50 to 3,000 psig.) @ operating temp
Outlet pressure for pilot regulator:	≈1 bar (15 psig.) @ operating temp
LPRD (low pressure relief device):	5.2-5.9bar (75 - 85 psi) automatic resetting poppet
Inlet pressure range for main regulator:	≈3 to 207 bar (50 to 3,000 psig.) @ operating temp
Outlet pressure for main regulator:	≈1 bar (15 psig.) @ operating temp
Operating temperature:	-20°C to 60°C (-4° F to 140° F)

Service (All Versions)

RCV MTBO:	5 years
Regulator units MTBO:	5 years
Torque for SAE-8-M (3/4-16 UNF 2A) inlet cylinder mounting threads:	CW. 60ft-lbs
Torque for SAE-4-F (7/16-20 UNF 3B) service ports for fittings:	CW. 60in-lbs
Torque for SAE-4-F (7/16-20 UNF 3B) service ports for regulators:	CW. 60in-lbs

Material Compatibility and System Design Statement

Materials such as aluminum, iron, steel, polymers and brass commonly used in any oxygen systems may ignite and burn under certain severe and adverse conditions. Although these conditions may be rare they are none-the-less possible in a high pressure pure oxygen environment. Design and manufacturing rules have been applied to this product to ensure the maximum amount of safety and compatibility with high pressure oxygen. The RCV/RCR system has been designed with maximum margin of safety while providing the most capable and lightest system suitable for aircraft applications.

Material And Design

To ensure the best margin of operational safety the main body of the RCV unit is made from 6061-T6 Aluminum, anodized green. The wetted parts (parts that come in direct contact and control high pressure oxygen) are made from CDA-360 brasses or 303 or 304 stainless steels. Where applicable the design guidance and rules for the RCV/RCR pertain to ASTM standard guide for designing systems for oxygen service G88-90 also G63, G93 and G94. Cleaning protocol was adopted from SAE-AIR1176A and other documents from CGA and ASTM. The regulators (peripheral) devices are designed, manufactured and cleaned to the same criteria. In addition, the RCV unit and each regulator have a serviceable stainless steel mesh filter on the high-pressure inlet ports. It is therefore the duty of the installer and user of the system to ensure that clean and proper practices are used to install, fill and use the system.

SECTION 8: SAFETY INFORMATION

SAFETY NOTICE FOR HIGH PRESSURE OXYGEN MANAGEMENT SYSTEMS

Important Safety Note:

Although Oxygen itself is not flammable, it is a powerful oxidyzer, and can cause materials that would otherwise have a high ignition temperature or be self extinguishing in a standard atmosphere to burn vigorously when in an oxygen rich environment. Therfore, extreme caution should be taken when handling and using aviation oxygen systems. The following section describes factors that are recognized as having caused or contributed to fires in oxygen systems:

Temperature:

As the temperature of a material increases, the amount of energy that must be added to produce ignition for combustion decreases. Operating an Oxygen system at unnecessarily high temperatures, whether locally or generally, reduces this safety margin. The ignition temperature of the many materials commonly used in oxygen systems is lowered in materials that otherwise might be self-extinguishing.

Pressure:

As the pressure of oxygen in an oxygen system increases, the ignition temperatures of its components typically decrease, and the rates of fire propagation increases. Therefore, operating an oxygen system at unnecessarily high pressures increases the probability of a fire. It should be noted that a pure oxygen environment, even at atmospheric pressures, may still pose a significant hazard with materials that are not compatible such as hydrocarbon oils.

Contamination:

Inadequate cleanliness during assembly, installation or service may cause contamination of oxygen systems. Abrasion and deterioration of system components over time may also cause contamination. Contaminates can be highly flammable and easily ignited. They may be introduced as liquids, solids or gases. Hydrocarbon oils such as hydraulic or engine oil are good examples. Even normally inert contaminates such as rust may produce ignition through particle impacts, friction and resonance heating effects.

Particle impact:

Collisions of inert or ignitable solid particles in a high pressure oxygen enriched environment are associated with potential ignition. Such ignitions may result from the particle being flammable and igniting upon impact and, in turn, igniting other system materials. Ignition may also result from heating of the particles and subsequent contact with system polymers, from fine flammable particles produced during collision, or from the direct transfer of kinetic energy during collision. Absolute removal of particles is not possible, and systems can self generate some particles from normal operation. The PCR-2 system has been designed to minimize this potential and filters are present at all of the high pressure inlet ports. The hazard associated with particles increases with both heat and temperatures of the system and the kinetic energies of the particles. It should be noted that the quantity of particles in a system will tend to increase with time and usage.

Resonance:

Acoustic oscillations (whistling-chatter) within resonant cavities are associated with rapid heating. The temperature rises more rapidly and achieves higher values where particles are present or where there are high gas velocities. Resonance phenomena in oxygen systems are well documented, but there are few design criteria.

Static electric discharge:

Electrical discharge from static electricity, possibly generated by high fluid flow under certain conditions, may occur, especially where particle contaminates are present. Composite fiber wound cylinders do not present any static electricity hazards unless they are not electrically part of the metallic components of the system or have the internal envelope (liner) ungrounded. Make sure your installation includes grounding the composite cylinder at the metallic point of the neck to the common ground point of the aircraft system.

Heat from compression:

Heat is generated from the conversion of a gas going from a low pressure to a high pressure rate. This typically occurs during a system filling operation. In addition, it occurs when high pressure oxygen is released into a dead-ended tube or pipe quickly compressing the residual oxygen that was in the tube or pipe ahead of it. The elevated temperatures produced can ignite contaminates or elevate system components above their ignition point. The hazard of heat from compression increases with system pressure, pressurization rates and temperature.

Oxygen System Safety Hazard Mitigation Tips:

Never fill, store, or operate your oxygen cylinder at temperatures or pressures beyond those recommended by the cylinder manufacturer. Ensure attached oxygen system components, such as pressure relief devices & regulators, are rated for the same pressures as the cylinder.

Your RCV/RCR comes pre-assembled and cleaned to aviation industry standards, however care must be taken to ensure all of your aircraft' s oxygen system components are properly cleaned before assembly & installation to avoid introducing contaminates.

When lubricating components during assembly, use only oxygen compatible lubricants (such as Cristolube™).

Ensure continued cleanliness throughout the life cycle of your RCV/RCR by occasionally checking your system during pre-flight inspections as well as every annual/ 100hr/ condition inspection. Verify that there are no visible contaminates in the transparent polyurethane oxygen tubes (if used for your oxygen system), and that the exterior surfaces of the RCV/RCR itself as well as the peripheral components are free of contaminates such as excessive dust, grease, or hydraulic fluids.

To avoid excessive heat generation due to compression or acoustic resonance within the system, always refill your oxygen tank at the appropriate reduced flow rate. Ensure your aircraft's oxygen system is properly grounded to avoid the possibility of static electric buildup and discharge. If a composite cylinder is used, make sure your installation includes grounding the composite cylinder at the metallic point of the neck to the common ground point of the aircraft system.

Responsibility:

It is the duty of the installer and user of the system to ensure that clean and proper practices are used to install, service and use the system.

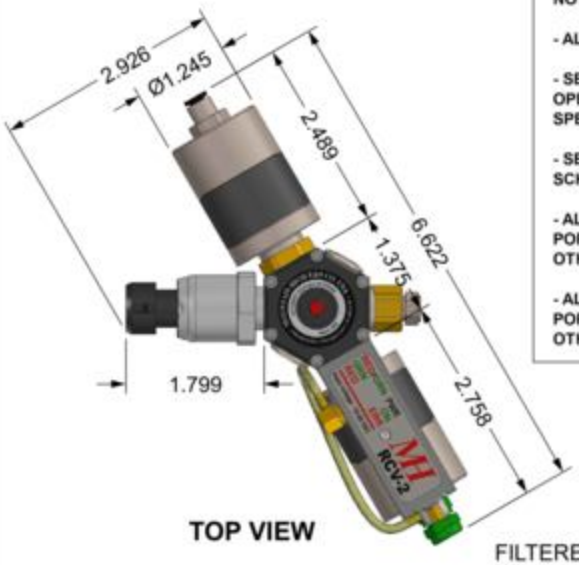
Exploded Section

NOTES:

- ALL DIMENSIONS ARE IN INCHES.
- SEE RCV/RCR MANUAL FOR DETAILED OPERATION AND INSTALLATION SPECIFICATIONS.
- SEE RCV/RCR MANUAL FOR WIRING SCHEMATICS.
- ALL THREE ITEM LOCATIONS IN "TANK" PORTS ARE INTERCHANGEABLE WITH EACH OTHER. STOCK CONFIGURATION IS SHOWN.
- ALL THREE ITEM LOCATIONS IN "VALVE" PORTS ARE INTERCHANGEABLE WITH EACH OTHER. STOCK CONFIGURATION IS SHOWN.

REVISION HISTORY

REV	ECO NO. YYYY-MM-DD	NAME	NOTES
-	2024-047 2024-08-21	KQM	Intial Release
A	2026-004 2026-01-28	KQM	Changed to RCV Hex Body with SAE-2F PRD port



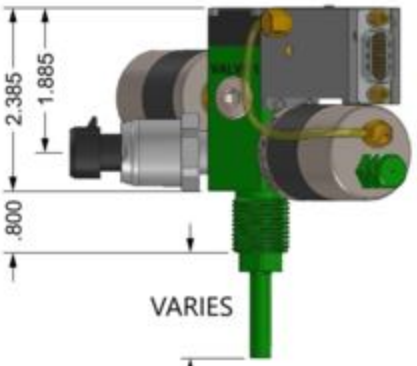
TOP VIEW

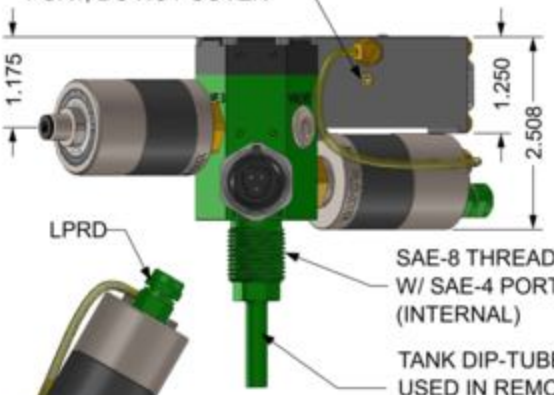
HIGH-PRESSURE VALVED/SWITCHED "VALVE" PORTS, (3) SAE-4

HIGH-PRESSURE UNVALVED/ALWAYS ON "TANK" PORTS, (3) SAE-4

CUSTOMER INTERFACE CABLE. CONNECT TO THIS CABLE CUSTOMER END ONLY, DO NOT INTERFACE DIRECTLY WITH THE DE-09 ON THE RCV MANIFOLD

RCV BODY ONLY VIEW



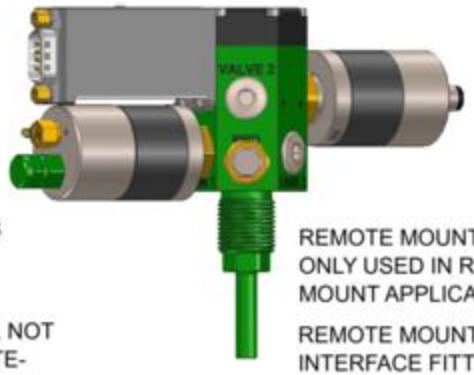


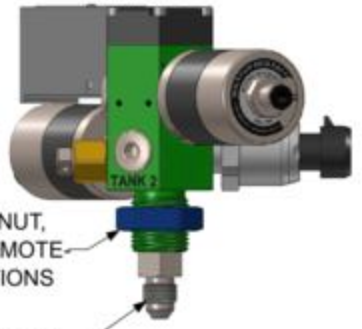
FILTERED AMBIENT PORT, DO NOT COVER

LPRD

SAE-8 THREADS W/ SAE-4 PORT (INTERNAL)

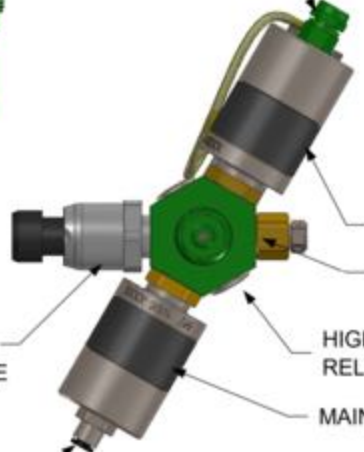
TANK DIP-TUBE, NOT USED IN REMOTE-MOUNT APPLICATIONS





REMOTE MOUNT NUT, ONLY USED IN REMOTE-MOUNT APPLICATIONS

REMOTE MOUNT INTERFACE FITTING OF CHOICE (JIC-4 SHOWN)



PILOT REGULATOR

TYP. PORT PLUG

HIGH PRESSURE RELIEF DEVICE (HPRD)

MAIN REGULATOR

PRESSURE SENDING UNIT. ALLOW EXTRA SPACE ON THIS SIDE TO MAKE ROOM FOR CUSTOMER INTERFACE CABLE

6MM ONE-TOUCH FITTING (MAIN O2 OUT)

BOTTOM VIEW

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

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

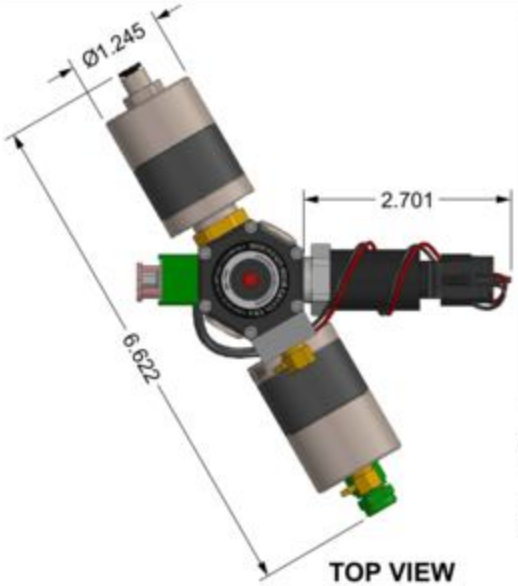
MOUNTAIN HIGH E&S CO.
REDMOND, OR. USA

DOC. TITLE	RCV/RCR Standard Config Form Factor					
DRAWN KQM 2024-08-21	DOC. NUMBER	**5RCVR-080-000**			DWG REV.	A
CHECKED EAM 2024-08-22						
ENGINEER JB 2024-08-22	SRC FILE	5RCVR-080-000$A	INV. PART NUMBER		MODEL #:	RCV/RCR
APPROVED HBS 2024-08-22	DWG FORMAT: ESR-002 Rev H [27]	DWG SCALE 1:2.5	DWG SHEET 1 OF 1		DWG SIZE	A 11x8½

REVISION HISTORY			
REV	ECO NO. YYYY-MM-DD	NAME	NOTES
-	2024-062 2024-11-21	KQM	Initial Release
A	2026-004 2026-01-28	KQM	Changed to new RCV Hex Body with SAE-2 PRD port

NOTES:

- ALL DIMENSIONS ARE IN INCHES.
- SEE RCV/RCR MANUAL FOR DETAILED OPERATION AND INSTALLATION SPECIFICATIONS.
- SEE RCV/RCR MANUAL FOR DETAILED SPECIFICATIONS.
- ALL THREE ITEM LOCATIONS IN "TANK" PORTS ARE INTERCHANGEABLE WITH EACH OTHER. STOCK CONFIGURATION IS SHOWN.
- ALL THREE ITEM LOCATIONS IN "VALVE" PORTS ARE INTERCHANGEABLE WITH EACH OTHER. STOCK CONFIGURATION IS SHOWN.



TOP VIEW

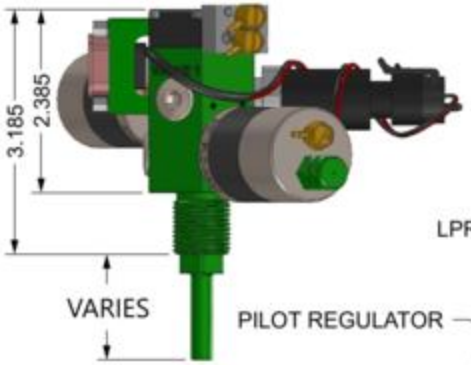
HIGH-PRESSURE VALVED/SWITCHED "VALVE" PORTS, (3) SAE-4

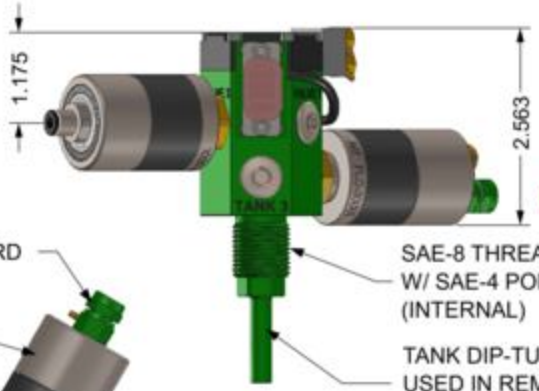
HIGH-PRESSURE UNVALVED/ALWAYS ON "TANK" PORTS, (3) SAE-4

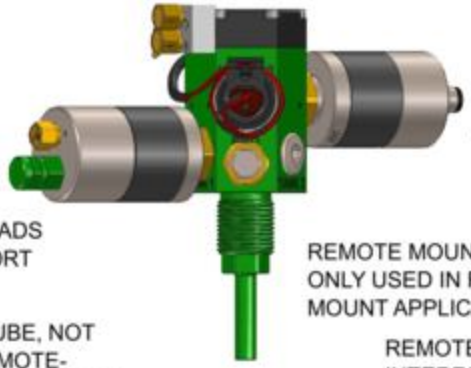
RCV BODY ONLY VIEW

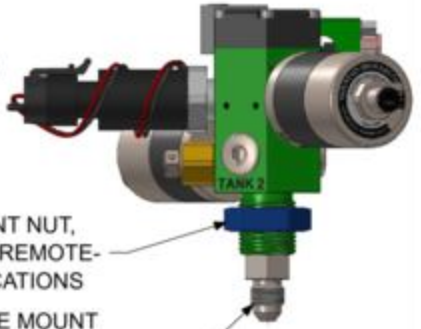
PNEUMATIC LINES BETWEEN THE RCV-2DP & PNEUMATIC SWITCH IN COCKPIT

Regulator Connection		
Tubing Color	Regulator Port	Switch Port
Yellow	"A"	"A"
Orange	"B"	"B"
Gray	"C"	"C"









LPRD

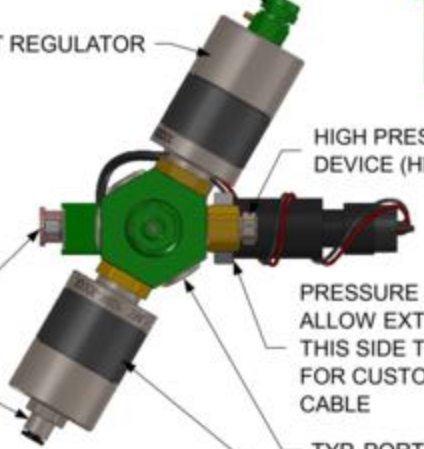
PILOT REGULATOR

SAE-8 THREADS W/ SAE-4 PORT (INTERNAL)

TANK DIP-TUBE, NOT USED IN REMOTE-MOUNT APPLICATIONS

REMOTE MOUNT NUT, ONLY USED IN REMOTE-MOUNT APPLICATIONS

REMOTE MOUNT INTERFACE FITTING OF CHOICE (JIC-4 SHOWN)



HIGH PRESSURE RELIEF DEVICE (HPRD)

PSU D-CONNECTOR

PRESSURE SENDING UNIT. ALLOW EXTRA SPACE ON THIS SIDE TO MAKE ROOM FOR CUSTOMER INTERFACE CABLE

6MM ONE-TOUCH FITTING (MAIN O2 OUT)

TYP. PORT PLUG

MAIN REGULATOR

BOTTOM VIEW

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

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

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

DRAWN KQM 2024-11-21	DOC. TITLE	RCV/RCR-2DP Standard Config Form Factor			
CHECKED EAM 2024-11-21	DOC. NUMBER	**5RCVR-082-000**			DWG REV. A
ENGINEER PLM 2024-11-21	SRC FILE	5RCVR-082-000$A	INV. PART NUMBER		MODEL #: RCV/RCR
APPROVED HBS 2024-11-21	DWG FORMAT: ESR-002 Rev H [27]	DWG SCALE 1:2.5	DWG SHEET 1 OF 1		DWG SIZE A 11x8½

NOTES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MH
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Oxygen Systems
Since 1985
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