# PYROTRONICS SERIES H
# HALON 1301 SYSTEM CONTAINERS AND VALVES

## INTRODUCTION

Pyr-A-Lon 1301 Engineered Systems are custom engineered fire suppression systems designed in accordance with NFP 12A. Pyr-A-Lon 1301 Engineered Systems are listed by Underwriters Laboratories, Inc. and

Underwriters Laboratories of Canada, and are approved by Factory Mutual Research Corporation. The instructions in this manual comply with the limitations and requirements established by those listings and approvals.

The extinguishing agent used in Pyr-A-Lon 1301 Engineered Systems is Halon 1301. Exactly how Halon 1301 extinguishes fire is not known: it has been termed a "chain breaking agent," meaning that it acts to break the chain reaction of the combustion process. Halon 1301 is chemically known as $CBrF_3$ (bromotrifluoromethane); it is super-pressurized with dry nitrogen to 360 psig to provide rapid discharge and mixing.

The National Fire Protection Association has established a concentration of 5 percent Halon in air as being sufficient for most flame extinguishment. Refer to the SYSTEM DESIGN section (page 14) and NFPA 12A for a thorough explanation of concentration requirements for various hazards. In accordance with NFPA 12A, paragraphs 2-1.1.3 and 2-1.1.4. the following restrictions on concentrations must be followed.

| Concentration | Restrictions |
|---|---|
| 4-7% | No restrictions on use |
| Between 7% and 10% | Can be used in unoccupied areas or in normally occupied areas where evacuation can be accomplished within 1 minute. Areas with a 10% concentration should be evacuated immediately upon discharge of agent. |
| Between 10% and 15% | Not to be used in normally occupied areas.<br>Can be used in normally *unoccupied* areas if evacuation can be accomplished within 30 seconds. Where this evacuation cannot be accomplished. Provisions must be made to prevent inhalation by personnel. |
| More than 15% | Provisions must be made to prevent in-halation by personnel. |

**CAUTION:** Halon 1301 is not effective on the following materials:

1. Chemical compounds or mixtures such as gunpowder or cellulose nitrate which supply their own oxygen.
2. Reactive metals such as sodium. potassium. magnesium, titanium, zirconium, uranium, and plutonium.
3. Metal hydrides.
4. Chemicals capable of undergoing auto-thermal decomposition (hydrazine and certain organic peroxides, for example).

Although Halon 1301 vapor has a low toxicity, its decomposition products can be hazardous. Decomposition takes Place on exposure to flame or hot surfaces at about 900ºF. The main decomposition products are hydrogen fluoride (HF), hydrogen bromide (HBr), bromine ($Br_2$), and small amounts of carbonyl fluoride ($COF_2$) and carbonyl bromide ($COB_2$).

The amount of Halon 1301 that will decompose while extinguishing a fire depends on the size of the fire, the concentration of Halon vapor, and the length of time Halon vapor is in contact with the flame or with heated surfaces. With small fires and rapid extinguishment. there is little decomposition: with large fires or slow extinguishment. there is a lot of decomposition. Rapid detection and immediate discharge at a high rate are therefore desirable so as to keep decomposition products at a minimum level. For further information on the toxicity of Halon 1301, and its decomposition produces. see Appendix A, 1-6.1, of NFPA Standard No. 12A.

**SYSTEM COMPONENTS**

Pyr-A-Lon 1301 Engineered Systems can be supplied with 15, 30, 60, 125, 250, 350, and 600 pound cylinders that are pressurized with dry nitrogen, at 70ºF, to 360 psi.

The cylinders are charged as follows:

| Cylinder | Fill increment | Total Fill Weights |
|---|---|---|
| 8 pound | 1 pound | 4-8 pounds(FM sets minimum fill at 5 pounds) |
| 15 pound | 1 pound | 9-15 pounds |
| 30 pound | 5 pounds | 20-30 pounds |
| 60 pound | 5 pounds | 35-60 pounds |
| 125 pound | 5 pounds | 65-125 pounds (FM sets minimum fill at 75 pounds) |
| 250 pound | 5 pounds | 130-250 pounds(FM sets minimum fill at 150 pounds) |
| 350 pound | 5 pounds | 255-350 pounds |
| 600 pound | 5 pounds | 355-615 pounds |

A Pyr-A-Lon 1301 Engineered System consists of a cylinder assembly, valve assembly, and whatever hardware is shown in Figure 1 necessary for that particular system. The operation temperature range of all hardware in a Pyr-A-Lon 1301 Engineered System is - 40ºF to 130ºF.

**CYLINDER AND VALVE ASSEMBLIES**

The dimensions of all eight cylinder and valve assemblies are shown in Figure 1. All cylinders are manufactured, tested. And marked in accordance with Title 49 of the Code of Federal Regulations.*

Three valve sizes are used: 1 inch, 2 inch, and 3 inch (See Figure 2, page 3). The 1 inch valve is used on the 8, 15, 30, and 60 pound cylinders: the 2 inch valve is used on the 125, 250, and 350 pound cylinders; the 3

inch valve is used on the 600 pound cylinder. The valves are of high-flow-rate design to provide the rapid discharge required by NFPA 12A.

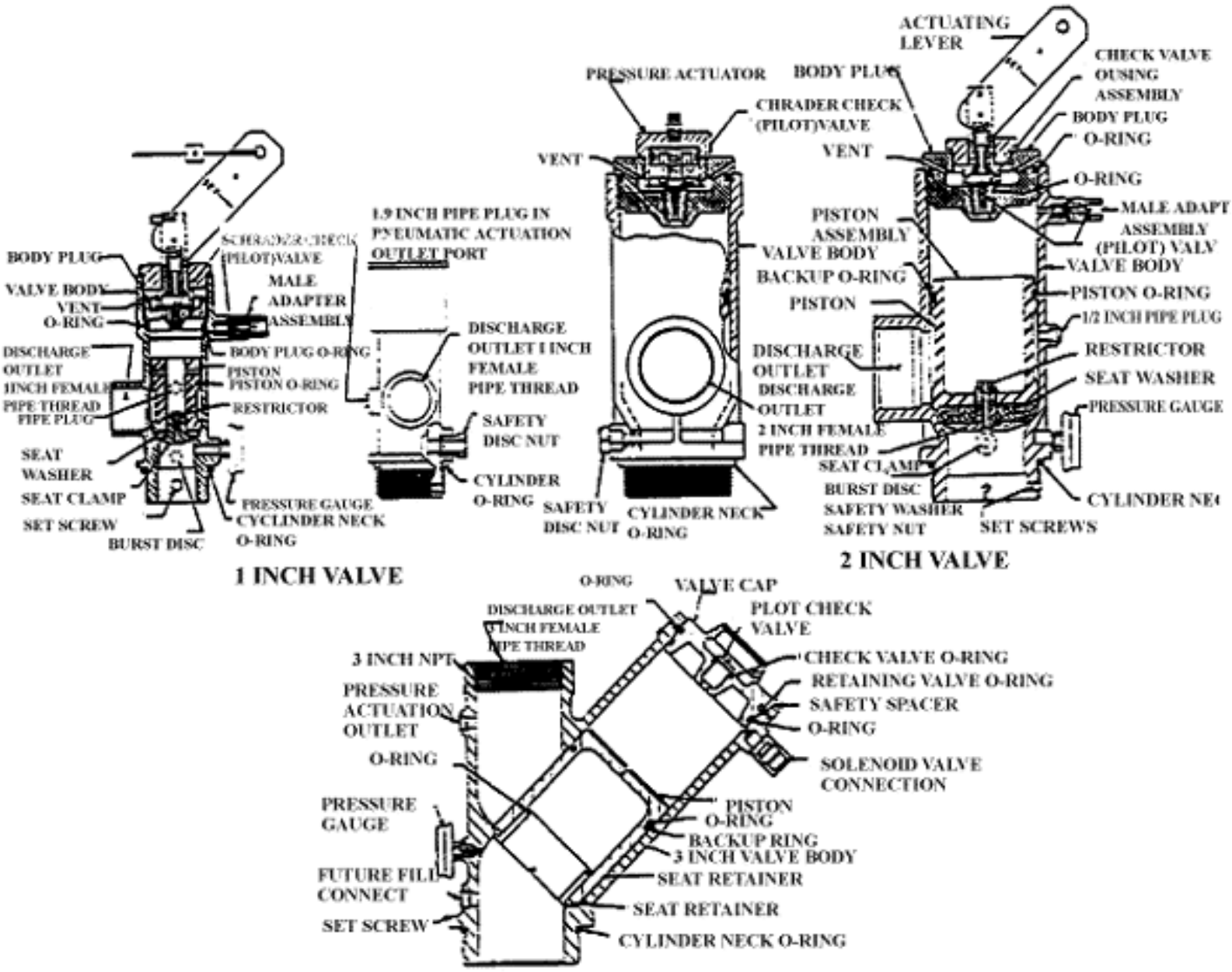
The 1, 2, and 3 inch valves are pressure-seated types that have a brass body, a brass piston with an elastomer seal. Pressure-releasing pilot check assembly for manual and/or pneumatic actuation. a burst disc assembly (1 and 2 inch sizes). and a pressure gauge. The valves can be fitted with an electric solenoid valve for electric actuation.

Actuation of the pilot check or electric solenoid relieves the pressure above the piston and allows the piston to travel upward in the bore of the valve. This action fully opens the valve, permitting Halon to discharge through the outlet.

**MANIFOLD**

The system manifold is considered part of the discharge piping and is covered in the **SYSTEM INSTALLATION** section (page 39) of this manual. In all systems using selector valves, the manifold must be fitted with a manifold safety that is comprised of a body with 3/4 inch male pipe thread, a safety disc. washer. and safety disc nut. Should liquid Halon be trapped in the manifold, it will be released before excessive pressure develops due to high temperatures.

* Title pertains to DOT-4BW-500 and 4BA-500 cylinder specifications.




**3 INCH VALVE**

**FIGURE 2**
**CYLINDER VALVES - 1, 2, AND 3 INCH**

## SIPHON TUBE

All 8, 15, 30, and 60 pound cylinders are fitted with a siphon tube having a curved lower end that permits the cylinders to be mounted vertically (upright) or at any angle between vertical and horizontal. The current production of 125 and 250 pound cylinders. which have the letter H under the discharge outlet. are also fitted with curved siphon tubes that permit them to be mounted vertically or at any angle between vertical and horizontal. Earlier produced 125 and 250 pound capacity cylinders, without the identifying H on the valve, have curved siphon tubes of different shapes which affect the discharge characteristics to the extent that the cylinders cannot be mounted at an angle less than 10 degrees from a horizontal position.

The inlet of the siphon tube is installed in the cylinder valve in line with the valve safety disc nut. The cylinder, when mounted horizontally or at an angle, must always be installed with the safety disc nut down. so that the valve outlet is in a horizontal position. (Refer to the **SYSTEM INSTALLATION** section, page 39. of the manual for details.)

The 350 and 600 pound cylinders are fitted with straight siphon tubes. They must only be mounted vertically.

**CYLINDER BRACKETS**

Vertical, angle, or horizontal mountings of one basic group of bracketing parts used in selective combinations. Refer to the **SYSTEM INSTALLATION** section (page 39) for details. A special mounting assembly for the 125 and 250 cylinder assemblies that bear the H identification is used for a horizontal installation. There is also an earlier version of a horizontal mounting assembly that is used for cylinder assemblies with the old type siphon tube. When the 125, 250, 350, and 600 pound cylinders are mounted in an upright position, a wall mounting bracket is used. It consists of a mounting channel and a cylinder strap.

**CYLINDER ACTUATING CONTROLS** (See Figure 3)

There are five types of controls used for actuating valves of Pyr-A-Lon cylinders: 1) electric solenoid, 2) local manual mechanical control, 3) remote manual mechanical control, 4) pneumatic control, and 5) manual-pneumatic combination control (See Figure 3). For Pyr-A-Lon system with more than one cylinder, these controls need only be located on one cylinder. The cylinder with the controls is designated the **master cylinder**. Any additional cylinders in the system may be operated as **slave cylinders** by using actuators powered by the pneumatic actuation outlet port of the master cylinder.

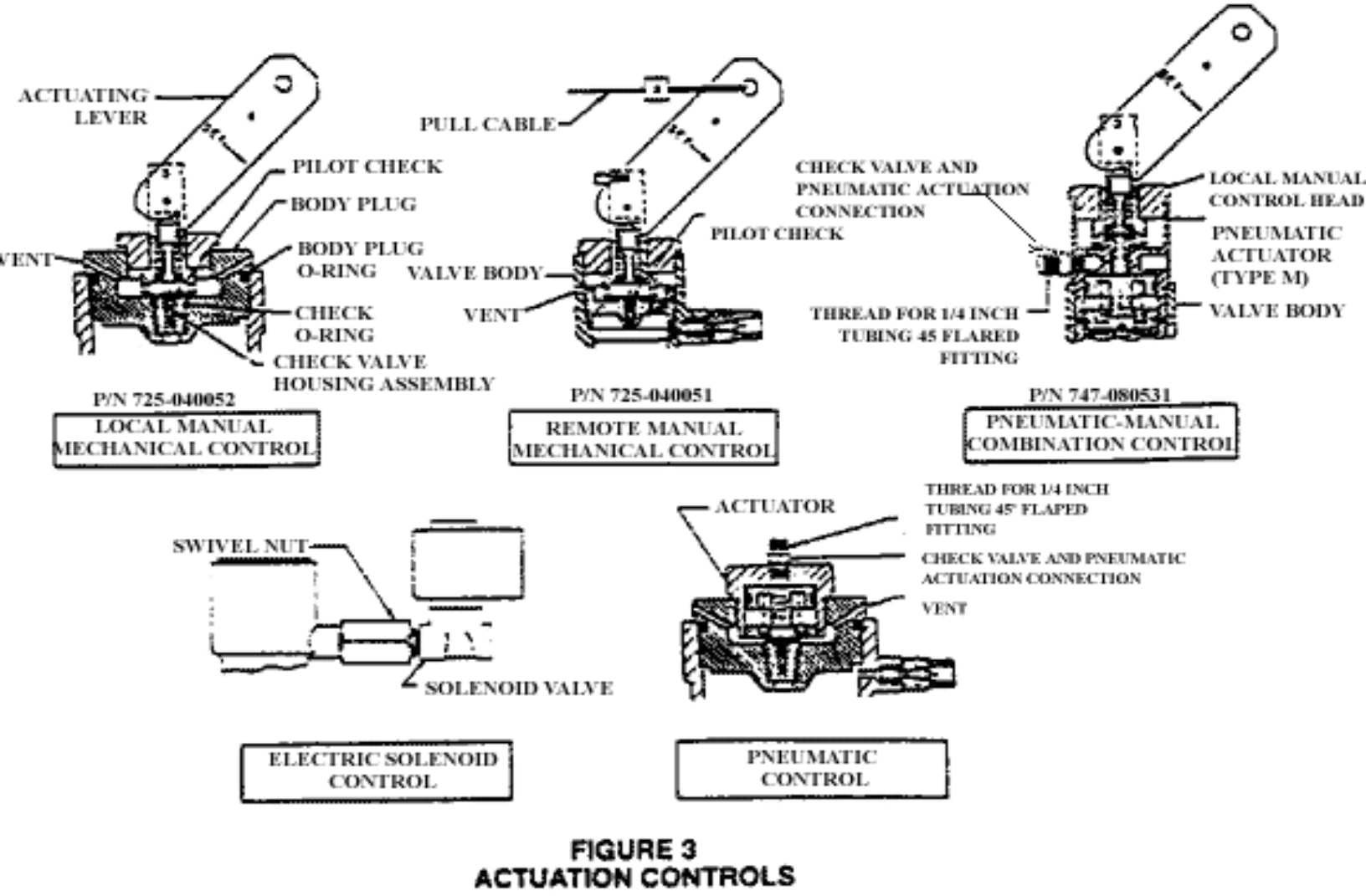



**FIGURE 3**
**ACTUATION CONTROLS**

**Electric Solenoid**

The solenoid valve is normally closed. When electrical energy is applied to the solenoid valve. It opens. This relieves the pressure above the cylinder valve piston and opens the cylinder valve.

The solenoid valve is equipped with 24 inch wire leads that are connected to a junction box near the valve. A typical cylinder valve with a solenoid actuator valve is shown in Figure 4. The solenoid valve is fitted with a swivel nut that allows field installation or removal of the solenoid from a 1 or 2 inch valve. Figure 5 shows the solenoid valve assembly with a knurled adapter for use with the 3 inch cylinder valve. Removal of the solenoid valve assembly is often required during recharging or servicing of the cylinder. Solenoid valves are available with 6 VDC, 24 VDC, and 120 VAC coils in explosion-proof housings for Class 1 and 2 locations.

The entire control circuit and the solenoid coils are under constant supervision. Any break in the circuit will result in a trouble signal at the control panel. The panel can be arranged to operate upon actuation of any of the following types of detectors that are compatible and UL listed or FM approved.

| | |
|---|---|
| Fixed Temperature Thermals | Rate Compensated Thermals |
| Rate of Rise Thermals | Infrared Detectors |

Ionization Smoke Detectors

Ultraviolet Detectors

Photoelectric Smoke Detectors

Manual Electric Stations

Or, any combination of the above

Pyrotronics recommends that actuation of a Pyr-A-Lon system be made by detection, involving two detectors or two zones of detectors (cross zoning). This prevents the system from being actuated by a transient condition that causes only one detector to operate. Other types of alarm panels can be used to actuate the system if they are UL listed or FM approved for that purpose and are electrically compatible. Consult Pyrotronics for information on detection systems which can be used with Halon extinguishing systems.

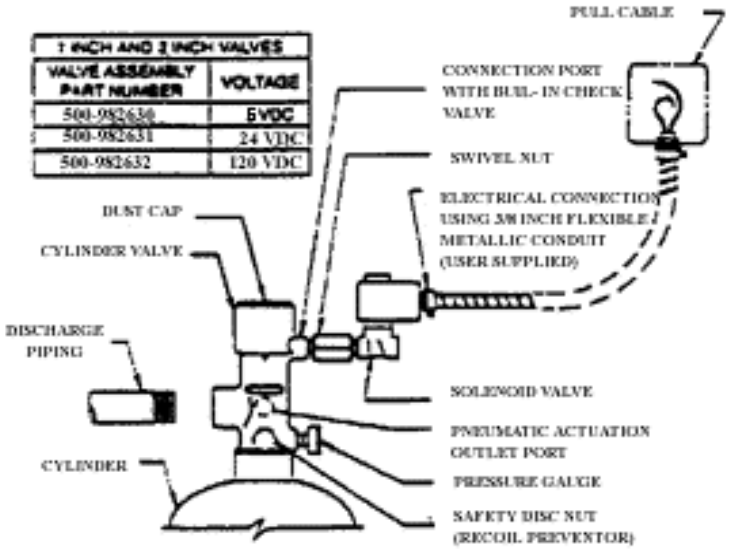



FIGURE 4
CYLINDER VALVE WITH
ELECTRIC SOLENOID ACTUATION

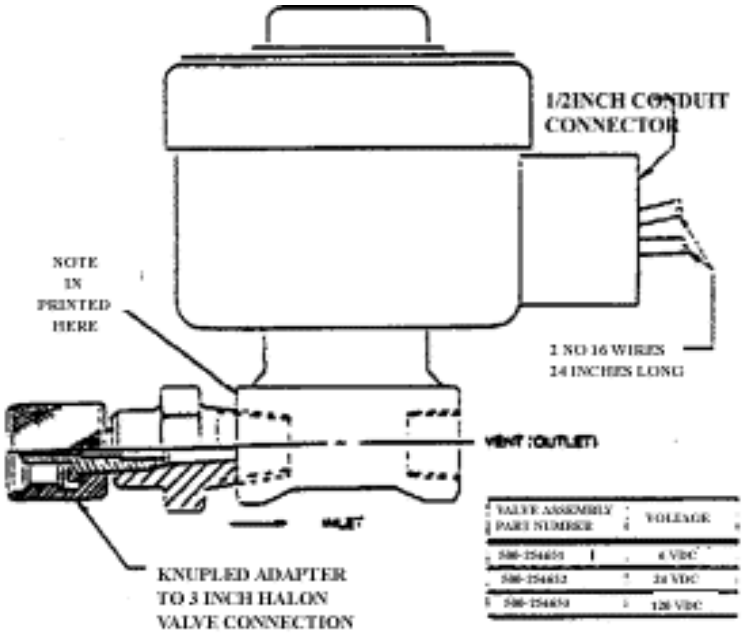



FIGURE 5
3 INCH SOLENOID VALVE
ASSEMBLY

UL EX3140

| 1 INCH AND 2 INCH VALVES | |
|---|---|
| VALVE ASSEMBLY PART NUMBER | VOLTAGE |
| 500-982630 | 6 VDC |
| 500-982631 | 24 VDC |
| 500-982632 | 120 VDC |

| VALVE ASSEMBLY | VOLTAGE |
|---|---|
| 500-256651 | 6 VDC |
| 500-256652 | 24 VDC |
| 500-256653 | 120 VDC |

FIGURE 6
CYLINDER VALVE WITH
LOCAL MANUAL MECHANICAL ACTUATION

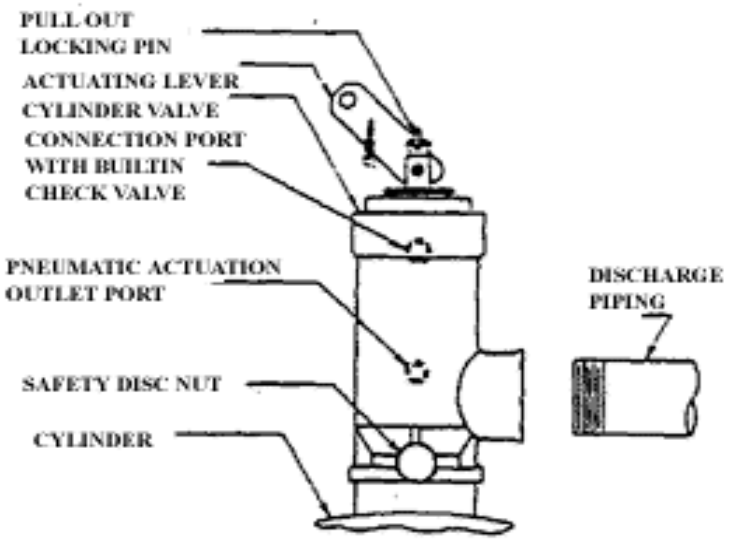
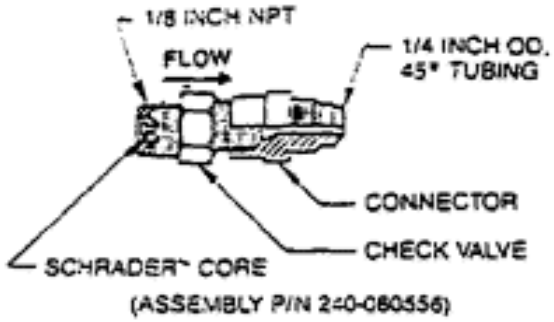



FIGURE 8
CHECK VALVE (FOR PNEUMATIC CONTROL)




Note: For FM approval, any electric solenoid control system must also have manual mechanical control.

**Local Manual Mechanical Control** (P/N 725-040052)

The local manual mechanical control (or actuator) is threaded into the top of the cylinder valve. The valve is actuated by moving the actuating lever of the mechanical control through 90º. The movement causes the actuation pin to depress. That opens the pilot check on the cylinder valve. The open pilot check. in turn. releases the pressure above the piston, allowing the cylinder valve to open fully. See Figures 3 (page 4) and 6. Manually operated selector valves are controlled locally by moving the ball valve handle through 90º.

**Remote Manual Mechanical Control** (P/N 725-040051)

This control actuates in the same manner as the local mechanical manual control, except that the lever is controlled remotely by a 1/16-inchein-diameter stainless steel pull cable enclosed in a half-inch EMT. with comer pulleys at each change-in-direction location. The cable terminates in a remotely located pullbox. See Figures 3 (page 4) and 7.

**Pneumatic Control** (P/N 725-040045)

A pressure actuator pneumatic control can replace the manual control on a cylinder valve. The control contains a piston large enough to provide the necessary force to open the pilot check when the Halon discharge pressure from a master cylinder or from another source is applied. This pressure is routed through 1/4 inch tubing, 1/4 inch pipe, or 1/8 inch pipe connected to a 1/8 inch check valve that is fitted into the master cylinder valve pressure actuation outlet port. See Figures 8 and 48 (page 49). The Pressure actuator can operate the slave cylinders through the master cylinder pneumatic actuation outlet port. A maximum of ten pressure actuators for slave cylinders can be used with each master cylinder. See also the **SYSTEM INSTALLATION** section (page 39) and Figures 3 (page 4), 9. and 48 (page 49).

**Pneumatic-Manual Combination Control** (P/N 747-080531)

A special pressure actuator (Type M) can be used to have a pneumatic control and also either a local or a

remote manual mechanical control on a cylinder valve. See Figures 3 (page 4) and 10.

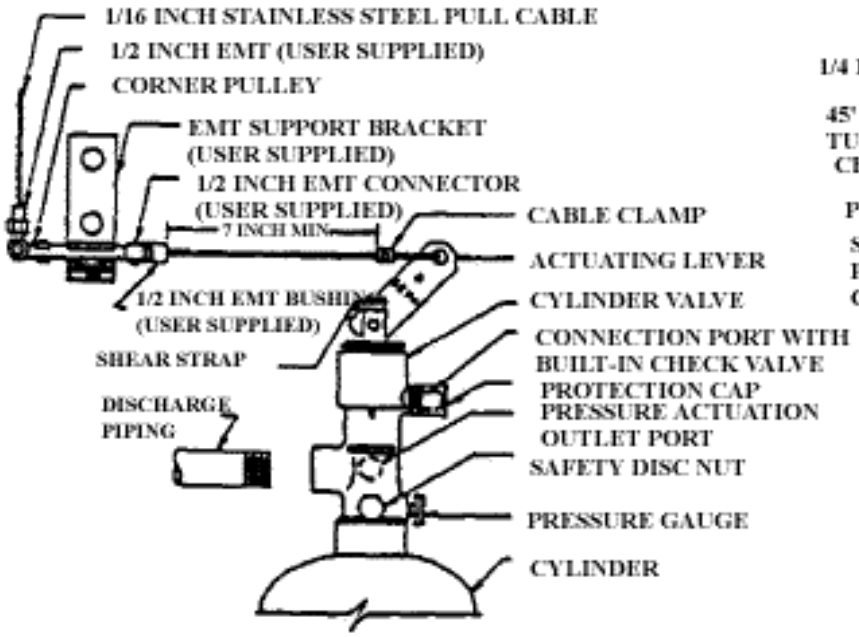



FIGURE 7
CYLINDER VALVEWITH REMOTE
MANUAL MECHANICAL CONTROL

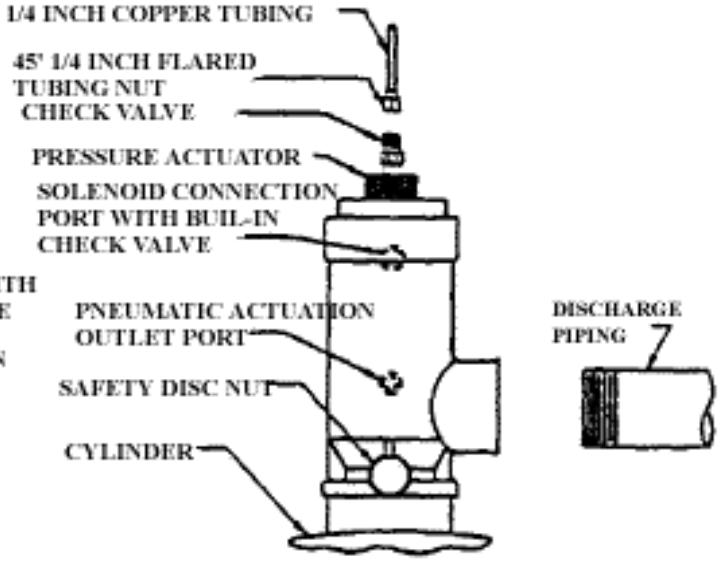



FIGURE 9
CYLINDER VALVE
WITH PNEUMATIC CONTROL

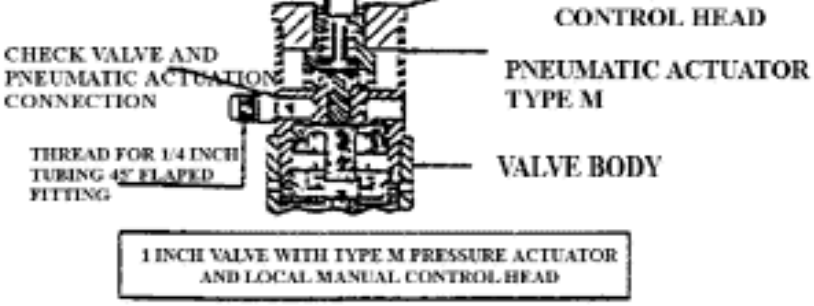
## NOZZLES

Three basic Type E nozzle sizes are available for use with Pyr-A-Lon 1301 Engineered Halon Systems - 3/8 inch, 1 inch, and 1 ½ inch sizes. Each basic size can be supplied as a 180º or 360º nozzle. See Figure 11. The nozzles are custom drilled to provide the amount of Halon flow needed according to the piping system and nozzle flow rate calculations. Nozzle usage and limitations are described in the SYSTEM DESIGN section (page 14) and **the SYSTEM INSTALLATION** section (page 39) of this manual.

The 3/8 inch size nozzles are also available as duct nozzles (Type D): they are used for installations in ducts or in cabinets. They are identical to the 3/8 inch standard nozzles (Type E) except for a straight pipe thread machined on the neck of the nozzles. A standard set of 3/4 inch conduit locknuts are fitted to the thread for locking the nozzles to the sheet metal duct or cabinet See Figure 12 (page7). All nozzle sizes are available in brass.

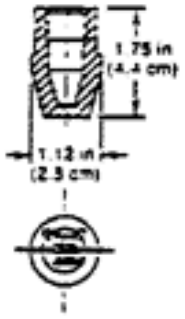
## MANIFOLD CHECK VALVES

Pyr-A-Lon 1301 System check valves utilize a poppet design that minimizes flow restriction of the system manifold. The valves are manufactured entirely of stainless steel. See the SYSTEM INSTALLATION section (page 39). These check valves are available in 1, 2, and 3 inch sizes; see Figure 13 (page 7).

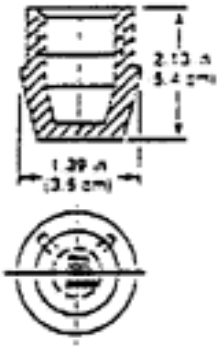



1 INCH VALVE WITH TYPE M PRESSURE ACTUATOR AND LOCAL MANUAL CONTROL HEAD

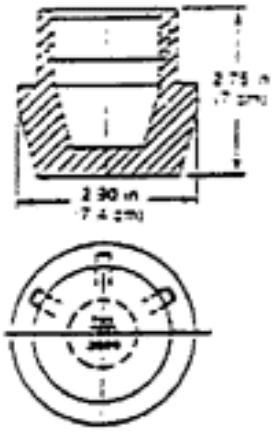
**FIGURE 10**
**CYLINDER VALVE WITH PNEUMATIC-MANUAL COMBINATION CONTROL**



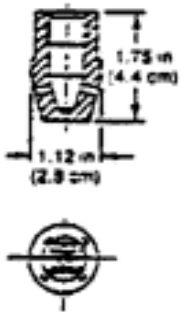

3/8 INCH DISCHARGE NOZZLE — 180°
(P/N 731-081385)



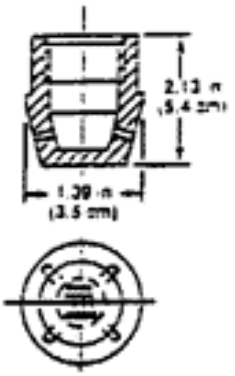

1 INCH DISCHARGE NOZZLE — 180°
(P/N 731-081383)



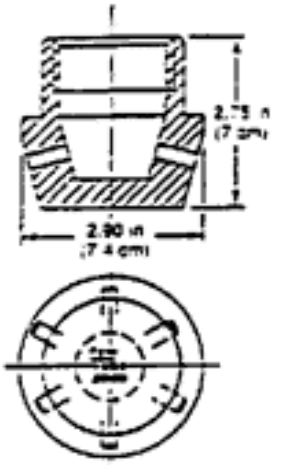

1-1/2 INCH DISCHARGE NOZZLE — 180°
(P/N 731-081384)



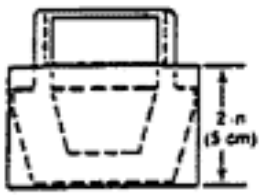

3/8 INCH DISCHARGE NOZZLE — 360°
(P/N 731-081034)




1 INCH DISCHARGE NOZZLE — 360°
(P/N 731-081032)




1-1/2 INCH DISCHARGE NOZZLE — 360°
(P/N 731-081033)




BLOWOFF CAP

FOR 3/8 INCH: P/N 345-181578
FOR 1 INCH: P/N 345-181577
FOR 1-1/2 INCH: P/N 345-140297

**FIGURE 11**
**TYPE E NOZZLE AND BLOWOFF CAPS**

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# WORMALD INTERNATIONAL
# ELECTRIC VALVE ACTUATOR

SA. ANSUL N.V.

PART OF WORMRLD

ELECTRIC VALVE ACTUATOR EVA

MFG DATA SHEET: T46

INTERNATIONAL GROUP

DATE:09/86 RE:
PAGE:

**SCOPE:**

**The EVA actuator has been specially designed to be mounted on all the ANSUL Halon and european carbon dioxyde valves of the latest generation by means of a swivel nut.**
**The coupling allows ease of connection, positioning and removal for testing or servicing.**

**This electric actuator may be used in combination with the multiple stock actuator (p/n 303444) offering pneumatic and manual actuation as well.**

**The actuator develops a very high actuation force, giving the possibility to operate either the halon valves types 360 psi US bar) and 600 psi (41,5bar) either the CO2 MA valves, from -20 degrees C up to +50 degrees C.**

**The connection and the disconnection of the plug-in connector provide the facility to remove the electric cable before disassembling the actuator from the valve. This is an appreciable advantage for inspection or arming in case of functional test and/or trouble shooting of the release circuit.**

**The connector is provided with & voltage peak suppression diode.**

**All materials in contact with the surrounding are in brass and zincolated bichromatod steel to provide a good corrosion resistance.**

**303426 Electric valve actuator - packed (fig 1) (with connector)**

**303445 Arming tool (fig 2)**

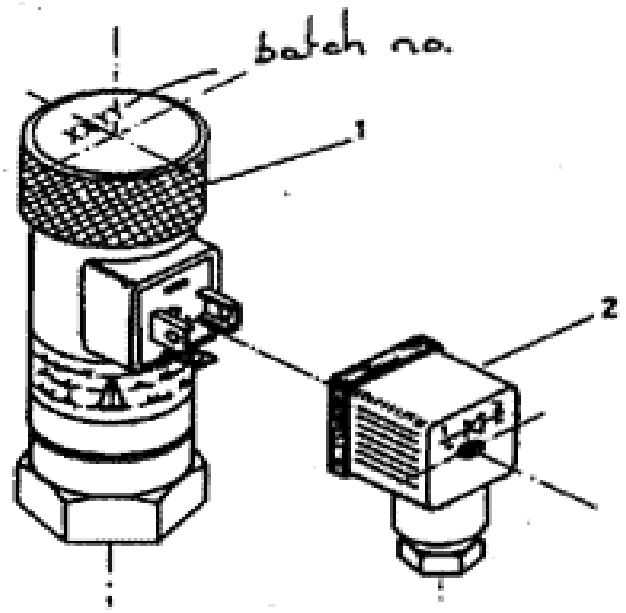


FIG No 1

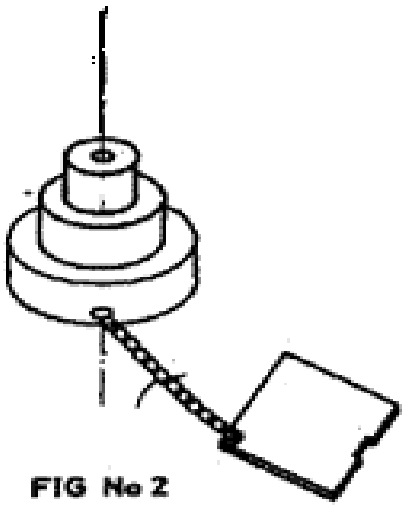
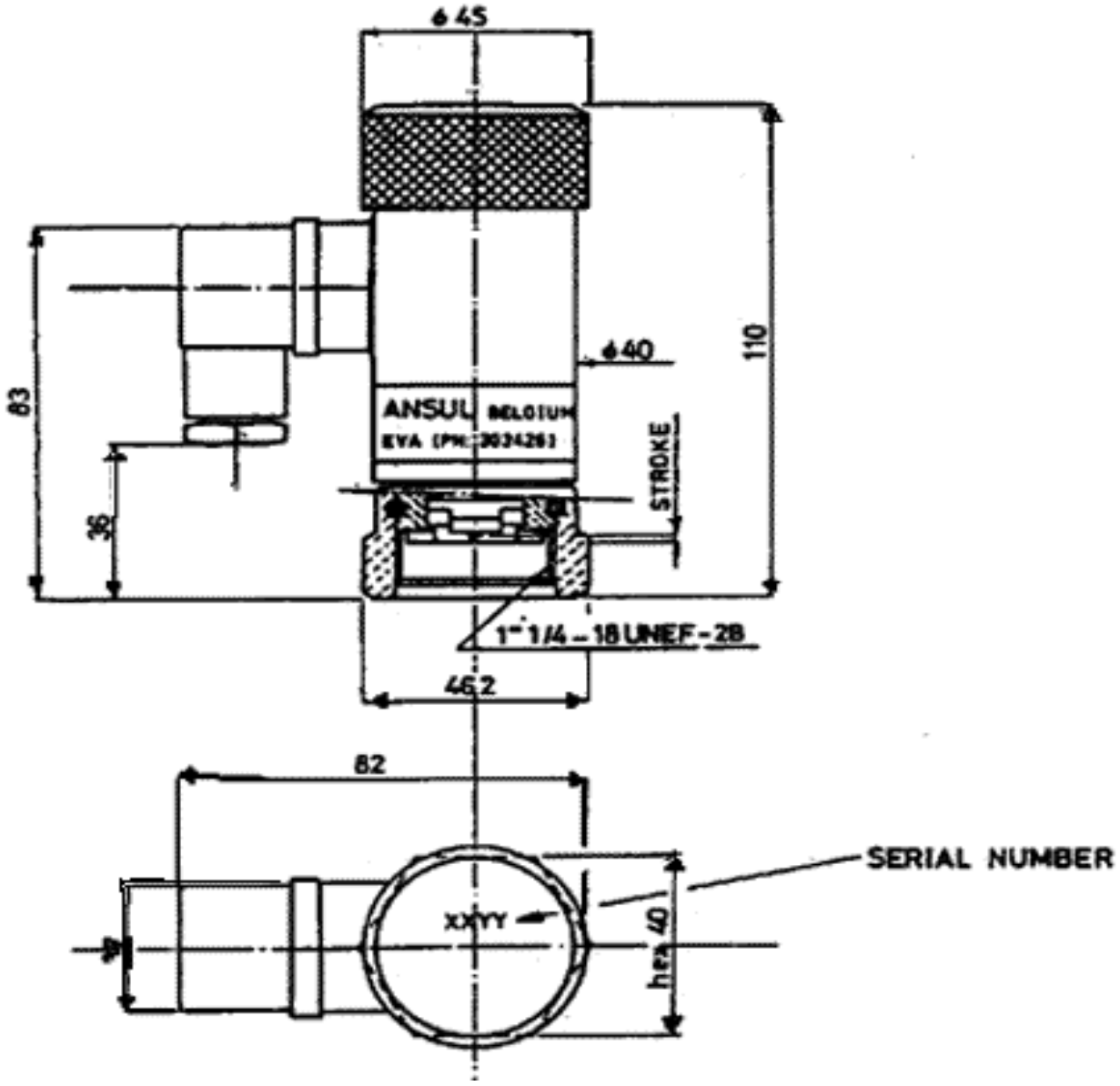


FIG No 2

## SEPARATE COMPONENTS

| Fig No 1 | Part No | Description |
|---|---|---|
| -- | 303426 | Electric valve actuator EVA - packed |
| 1 | -- | 303426 without connector |
| 2 | 801216 | Connector |
| Fig No 2 | Part No | Description |
| - | 303445 | Arming tool - packed |

## DIMENSIONS AND CONNECTION DATA




**MATERIAL:**

**- Body: brass**

**-Coupling nut: brass**

**- Armature: mild steel (zincplated and bichromated)**

**- Connector: plastic**

**DATA DESIGN**

**-solenoid data:**

**- operating wattage: 24 VDC (+/- 6V)**

**- current: 100 mA(min)**

**- resistance: 180 Ohm (135 mA at nominal 24 VDC)**

**- temperature range:**

**- installed: -20 degrees C to +50 degrees C**

**- stored -30 degrees C to +75 degrees C**

**- functional data:**

**- potential energy stared: 2 joules**

**- minimum pull-in wattage: 18 VDC**

**- minimum drop out voltage after release, the spring pushes permanently on the piston with sufficient force to maintain the schrader valve open**

**- min. voltage application time : 1 sec.**

**- max. recommended voltage application time: 1 min. (e.g. during tests)**

**- plug-in connection date:**

**- cable gland : PG 11**

**- terminals: capability : 1, 5mm$^2$ flexible wire**

**- terminate: 3 plugs No 1 = positive**

**No 2= negative**

**□ = earth**

**- projection: by suppression diode 1N4007**

**- tightening grade: IP65**

## VALVE COMPATIBILITIES

**The EVA actuator is designed for mounting on the following valves:**

| | | |
|---|---|---|
| Halon:360 psi (25 bar) | MA valve 3/4" | (pn 302934) |

| | | |
|---|---|---|
| | MA valve 3/4" | (pn 302936) |
| | Valve 1" | (pn 302797) |
| | Valve 2" | (pn 302796) |
| 600 psi (41,5 bar) | Valve 1" | (pn 302817) |
| CO2 | MA valve 3/4" | (pn 302935) |
| | MA valve 3/4" | (pn 302937) |

## ARMING OF THE ACTUATOR

**To arm the EVA actuator. the arming tool pn 303445 is needed. Arming is a very simple operation, one must put the actuator on the arming block and by an action of both hands on the top of the actuator, it will be armed. An arming forces between 20 kg and 25 kg is required.**

## SHIPPING DATA

**- electric valve actuator:**

**Part No 303426 (packed in carton box)**

**Box dimensions : 130 x 90 x 55.**

**Shipping weight : 0.9 kg**

**- arming tool:**

**Part No 30344S (packed in carton box)**

**Box dimensions : 95 x 90 x 70**

**Shipping weight: 0.5 kg**

**WORMALD INTERNATIONAL**
**1 " NGT HALON 1301 VALVE**

# M.A.-VALVE WITH W28, 8X14/" OR 1" NGT HALON VERSION



## SCOPE:

**The valve is a differential spool type which leads itself to flexible modes of actuation i.e. electrical, pneumatic. manual, etc.. . The primary material is brass which makes the valve inherently corrosion resistant.**

**A cutaway view on page 2 shows the valve its operation is as follows :**

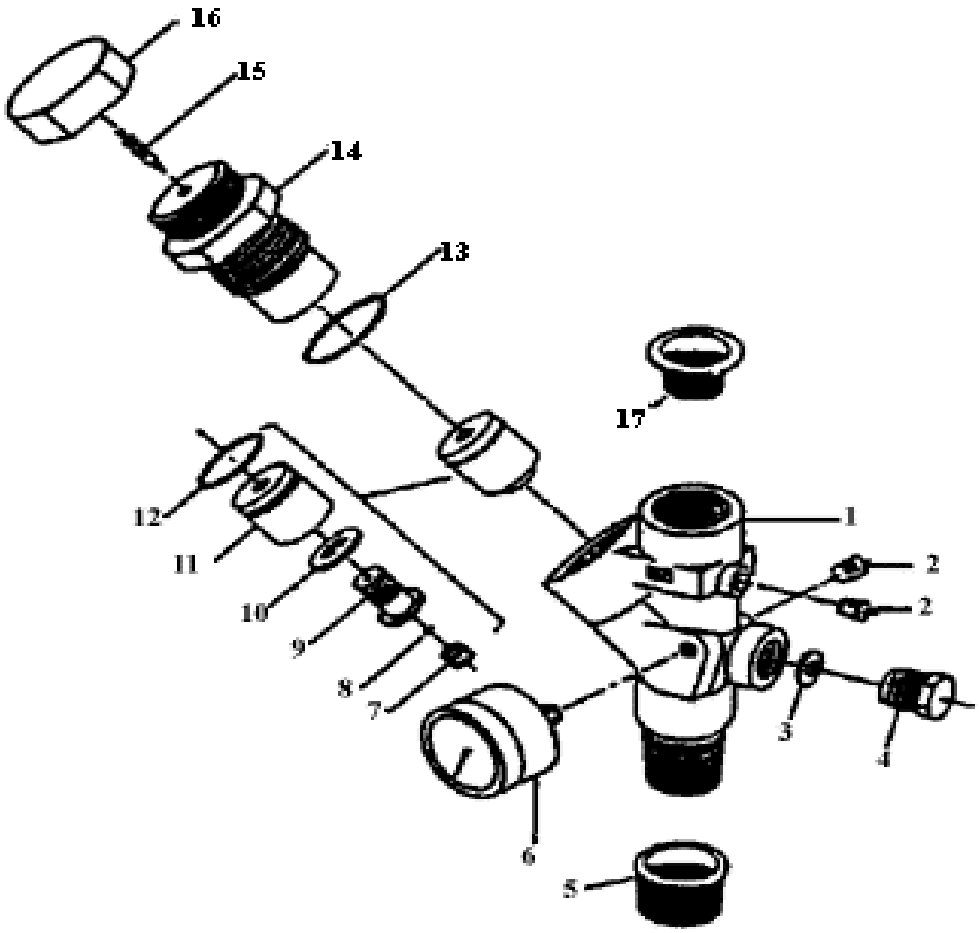
**Once a tank has been filled and pressurized, the valve is sealed by means of a nitrogen overpressure in the B-chamber. This pressure propels the spool into the valve closed position. Due to the rubber ball in the check housing of the spool, the gas flow from B to A is checked.**

**Even when the overpressure disappears, the pressure in B will never be less than in A. The rubber ball, acting as a free floating ball. allows minute flaw through the spool. The difference of areas of bares A and B produces a positive sealing force.**

**By using any of the actuators, the actation is accomplished by venting the pressure from the upper chamber through the vent valve D. By this venting, the rubber ball checks the gas flow from A to B and the tank pressure propels the spool into its upper position, allowing maximum free passage to the flow.**

| Fig No | Part No | | Description |
|---|---|---|---|
| - | W 28, 8x14/" version | 1: NGT version | |
| - | 302934 | | M.A.-valve V 22,8 x14/" - packed |
| - | 302866 | | M.A.-valve W 22, 8 x14/" - unpacked |
| - | | 302936 | M.A.-valve 1" NGT - packed |
| - | | 302886 | M.A.-valve 1" NGT - unpacked |
| 1 | 302861 | | Valve body W 22, 8 x14/"-brass |
| | | 302877 | Valve body 1" NGT - brass |

| | | | |
|---|---|---|---|
| 2 | 801097 | 801097 | Plug (2x) - brass |
| 3 | 303441 | 303441 | Safety disc gold plated - brass(ink marking code number 0) |
| 4 | 302743 | 302743 | Safety disc nut- brass(marked 0 to signify that the bursting value = 54 bar |
| 5 | 801095 | 801096 | Protection cap - plastic |
| 6 | 800627 | 800627 | Gauge - brass |
| 7 | 303909 | 303909 | Check plug - brass |
| 8 | 31699 | 31699 | Ball - rubber |
| 9 | 303908 | 303908 | Check housing - brass |
| 10 | 302263 | 302263 | Gasket O.D. 22 mm - I.D. 12 mm - th. 3.1mm - polychloroprene 95º Share A |
| 11 | 303907 | 303907 | Spool - brass |
| 12 | 801092 | 801092 | O-ring I.D. 20.3mm - th. 2.62 mm polychloroprene 90º Share A |
| 13 | 800484 | 800484 | O-ring - I.D. 28.3 ma - th. 1.78 mm buna-n 70º Share A |
| 14 | 303906 | 303906 | Coupling body - brass |
| 15 | 31712 | 31712 | Valve core - rubber, copper and stainless steel |
| 16 | 302887 | 302887 | Cap - brass |
| 17 | 801107 | 801107 | Protection cap - plastic |




**DIMENSIONS AND CONNECTION DATE:**

**DESIGN DATE:**

**- Gas: Halon 1301 + Nitrogen**

**- Working pressure: 25 bar at 21ºC, in a 360 psi Halon 1301 system, when the tanks are filled at a maximum rate of 1,13 kg/L**

**- Design temperature: -20ºC to +55ºC (-40ºC to +65ºC for shipment only- non pressurized)**

**-Actuation force an valve care :**

**theoretical minimum = 30 N**
**Recommended minimum =60 N**

**- Safety relief device : 54 +/- 3 bar**

**- Pressure drop : 4 m equivalent length of 3/4" pipe schedule 40**

**SHIPPING DATE:**

| | |
|---|---|
| W 28,8 : part No | :302934 (packed in carton box) |
| dimensions | :height 85 - width 90 - length 140 |
| shipping weight | :1,4 kg |
| 1" NGT : part No | :302936 |
| dimensions | :height 85- width.90 - length 140 |
| shipping weight | :1,5 kg |

**WORMALD INTERNATIONAL**
**MULTIPLE STACK ACTUATOR**

SA. ANSUL N.V.

PART OF WORMRLD

INTERNATIONAL GROUP

MULTIPLE STACK ACTUATOR

MFG DATA SHEET: T49

DATE:10/86 RE:

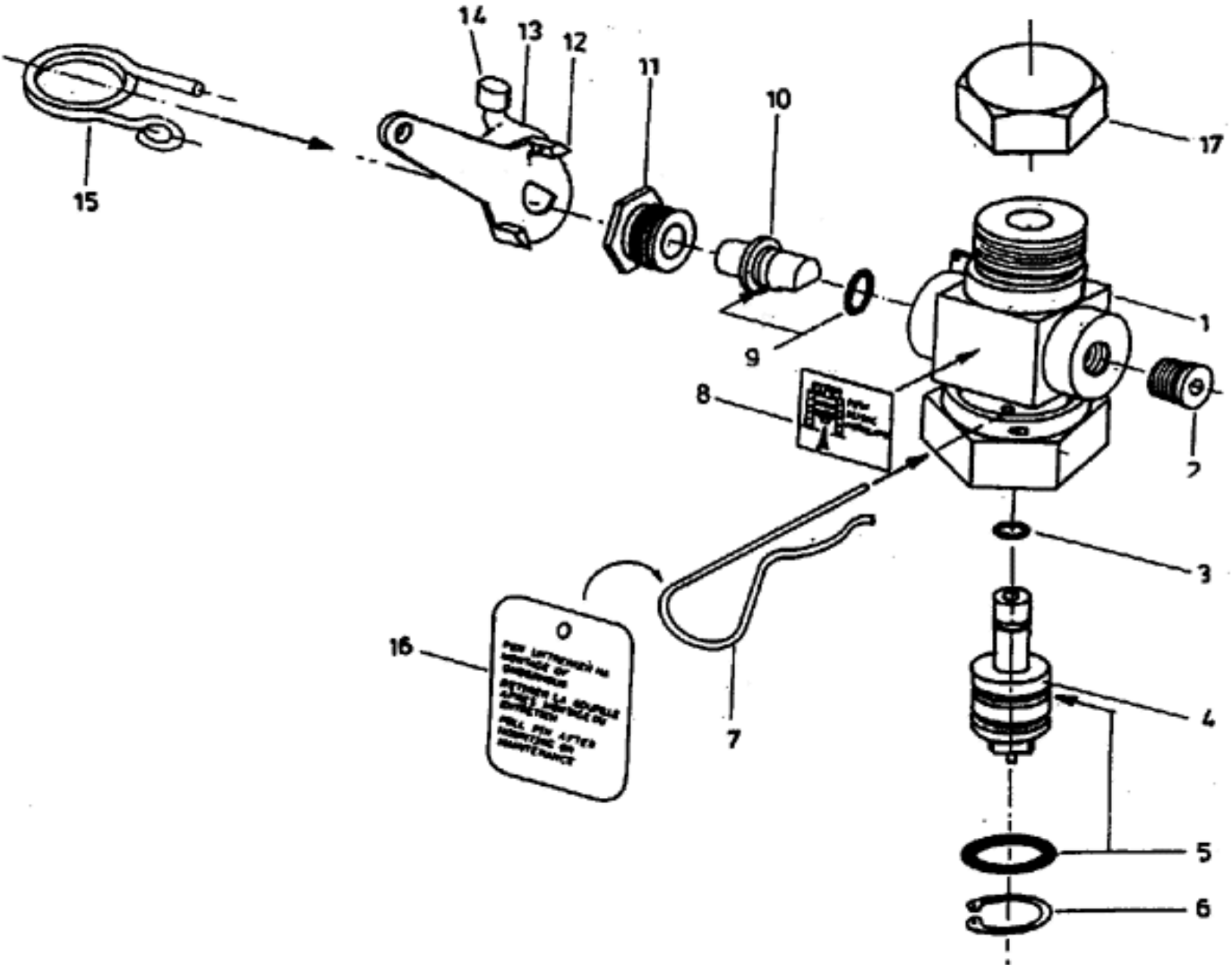
**SCOPE:**

**The multiple stack actuator is a very compact actuator to be mounted on the MA Valves or 1" and 2" Halon valves.**

**This multiple stack actuator differs from the multiple actuator in this way that the EVA electric actuator can be mounted (or stacked) on the top.**
**It can be operated pneumatically or manually whether accessories are added.**
**These accessories are the same as for the multiple actuator and are described in data sheet T48.**

**A lock pin which look like a big hairpin, is provided to insert during erection, inspection and maintenance, to avoid a spurious activation.**

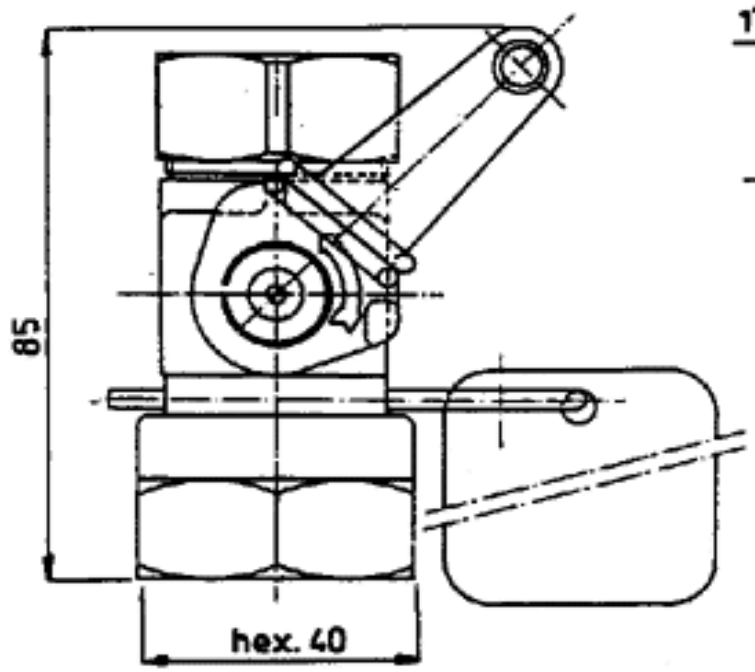
**A breakseal for the actuation lever is also provided.**

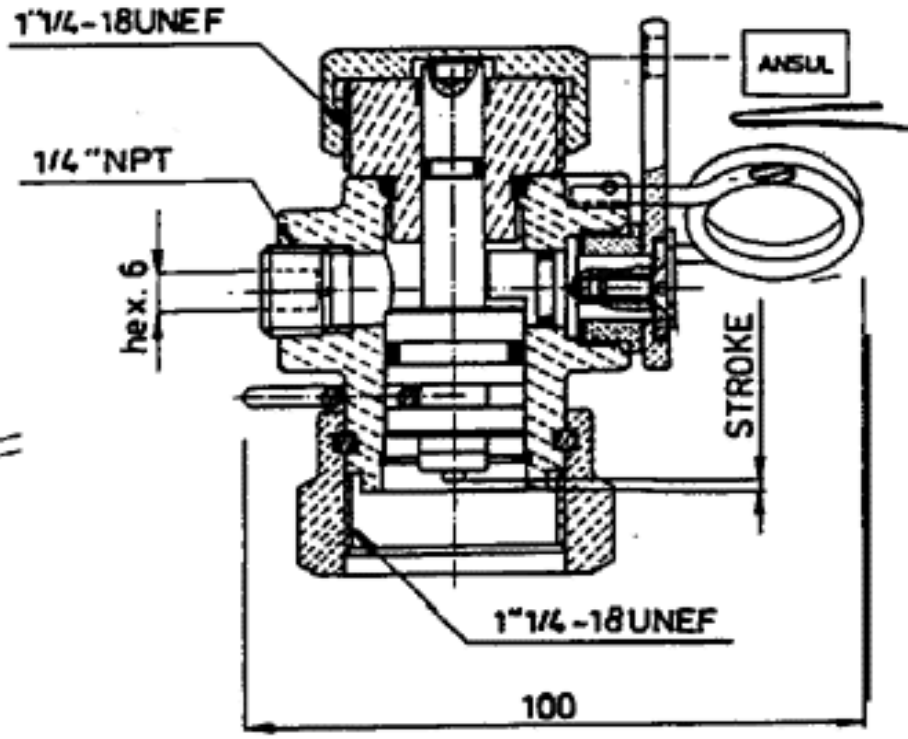



| Fig No | Part No | Description - material |
|---|---|---|
| - | 303444 | Multiple stack actuator- packed |
| 1 | - | Body assembly - brass |
| 2 | 303248 | Plug 1/4 NPT - brass |
| 3 | 800050 | O-ring ID 6.07 Th. 1.78 mm - Buna-N |
| 4 | 303449 | Piston - brass |
| 5 | 801098 | O-ring ID 15.55 mm Th 2.62 mm - Buna-N |

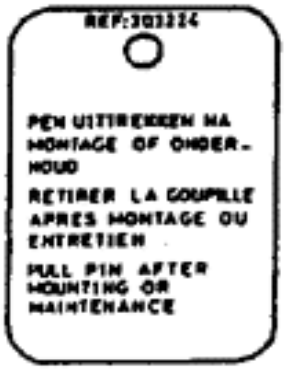
| | | |
|---|---|---|
| 6 | 801099- | Circlip ID 21 mm |
| 7 | 302883 | Lock pin - stainless steel 302 |
| 8 | 302769 | Warning label - adhesive vinyl |
| 9 | 800797 | O-ring ID 8.9 mm Th 1.9 mm - Buna-N |
| 10 | 302893 | Axle- brass |
| 11 | 302894 | Guide- brass |
| 12 | 303010 | Lever- brass |
| 13 | 900631 | Seal wire-plastic |
| 14 | 300741 | Seal clip - iron (white enamelled - Ansul logo) |
| 15 | 303011 | Safety pin - stainless steel |
| 16 | 303224 | Warning label - vinyl |
| 17 | 302887 | Cap - brass |

## DIMENSIONS AND CONNECTION DATA

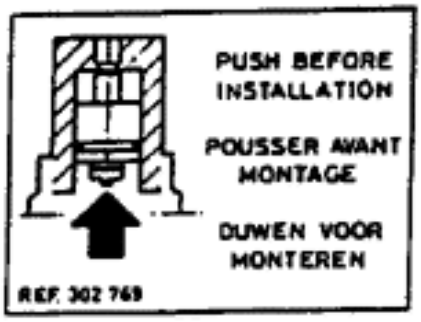



WARNING LABEL




For locking pin




For body

## DESIGN DATA

| | Actuation pressure | | Force on lever | |
|---|---|---|---|---|
| **ANSUL valves on** | **Minimum** | **Recommended** | **Min** | **Rec** |
| Halon 360 psig tank at 50º and filled with 1.1 kg/l | 1 bar (15 psig) | 2 bar (30psig) | 7.5M | 15 N |
| Halon 600 psig tank at 50º and filled with 1.13 kg/l | 2.75 bar (25 psig) | 2.75 bar (40 psig) | 13 N | 20N |
| CO2 cylinder at 50º and filled with 0.75 kg/l | 3.5 bar (55 psig) | 4.5 bar (70 psig) | 26N | 35N |

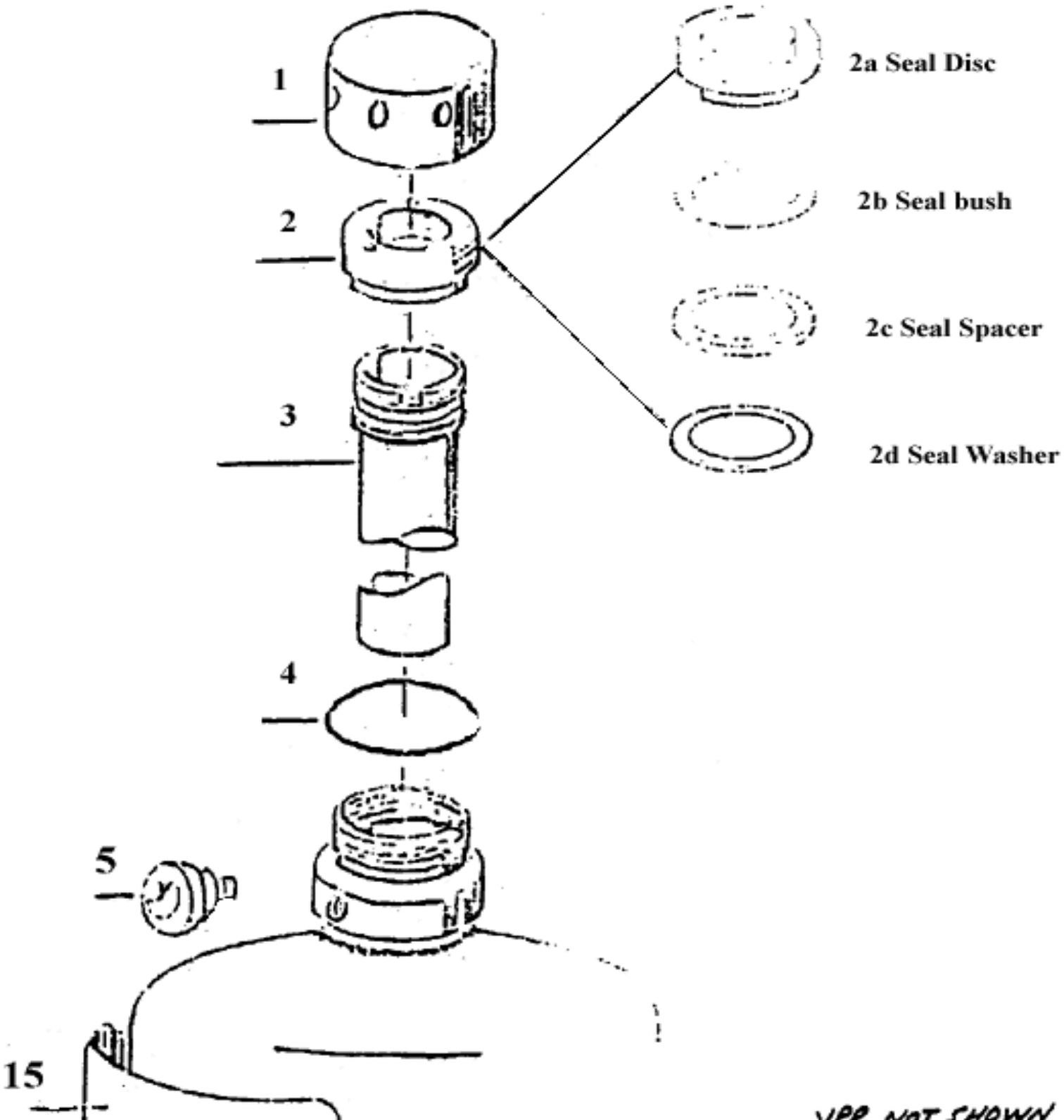
## SHIPPING DATA

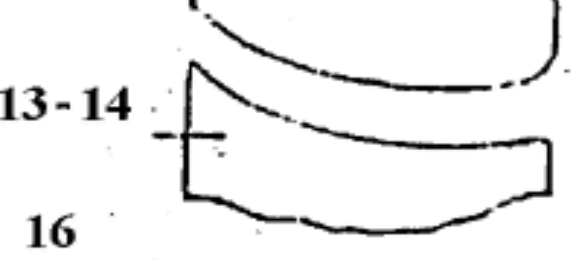
**Multiple stack actuator:**

**part No. 303444**
**box dimensions 95 x 90 x 70 mm**
**weight: approx. 700 g**

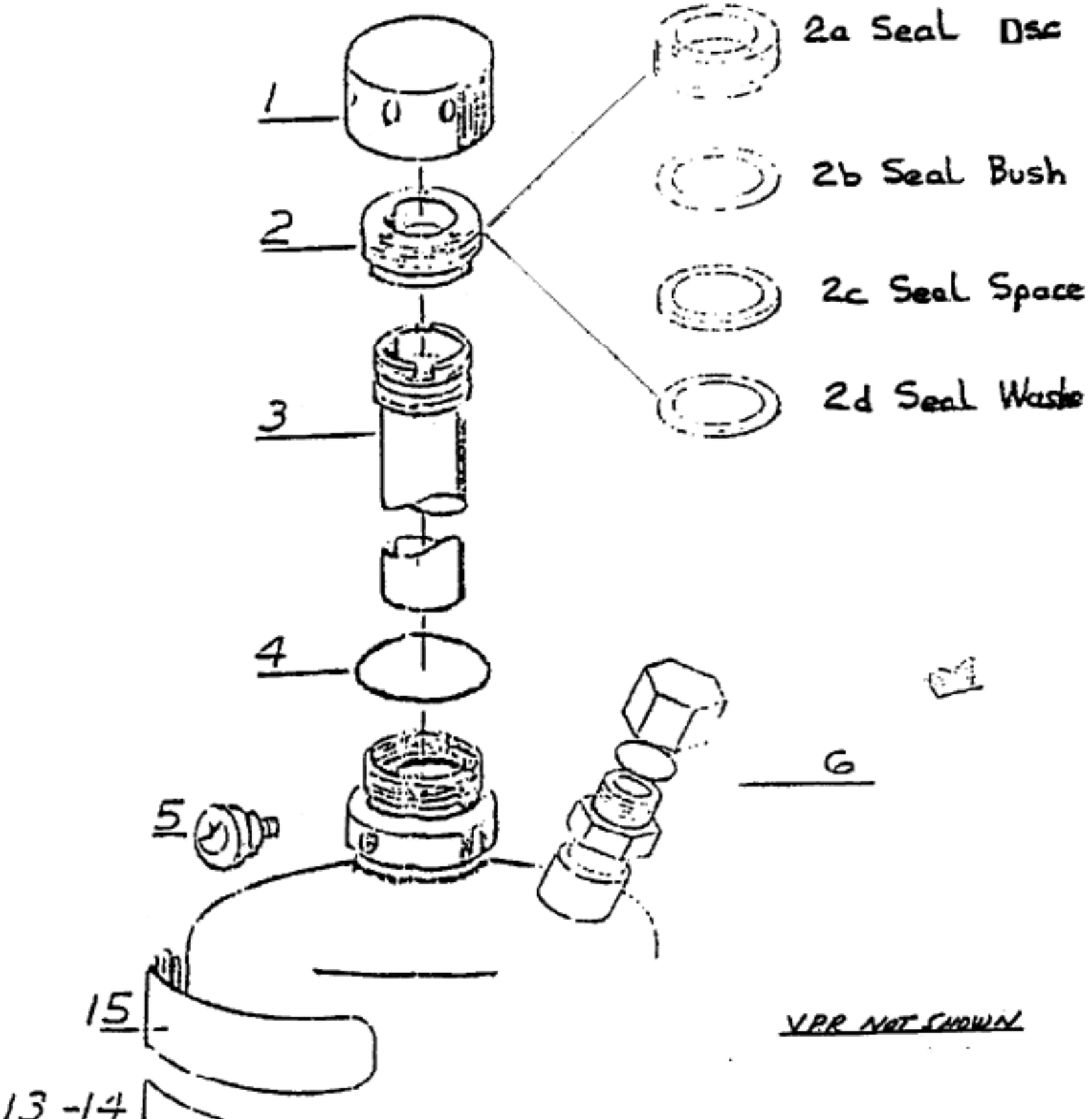
**WORMALD INTERNATIONAL**
**MK I, II, III, IV, V AND HIGH FLOW**
**HALON 1301 CONTAINERS**

**MK I & II PARTS EXPLOSION**

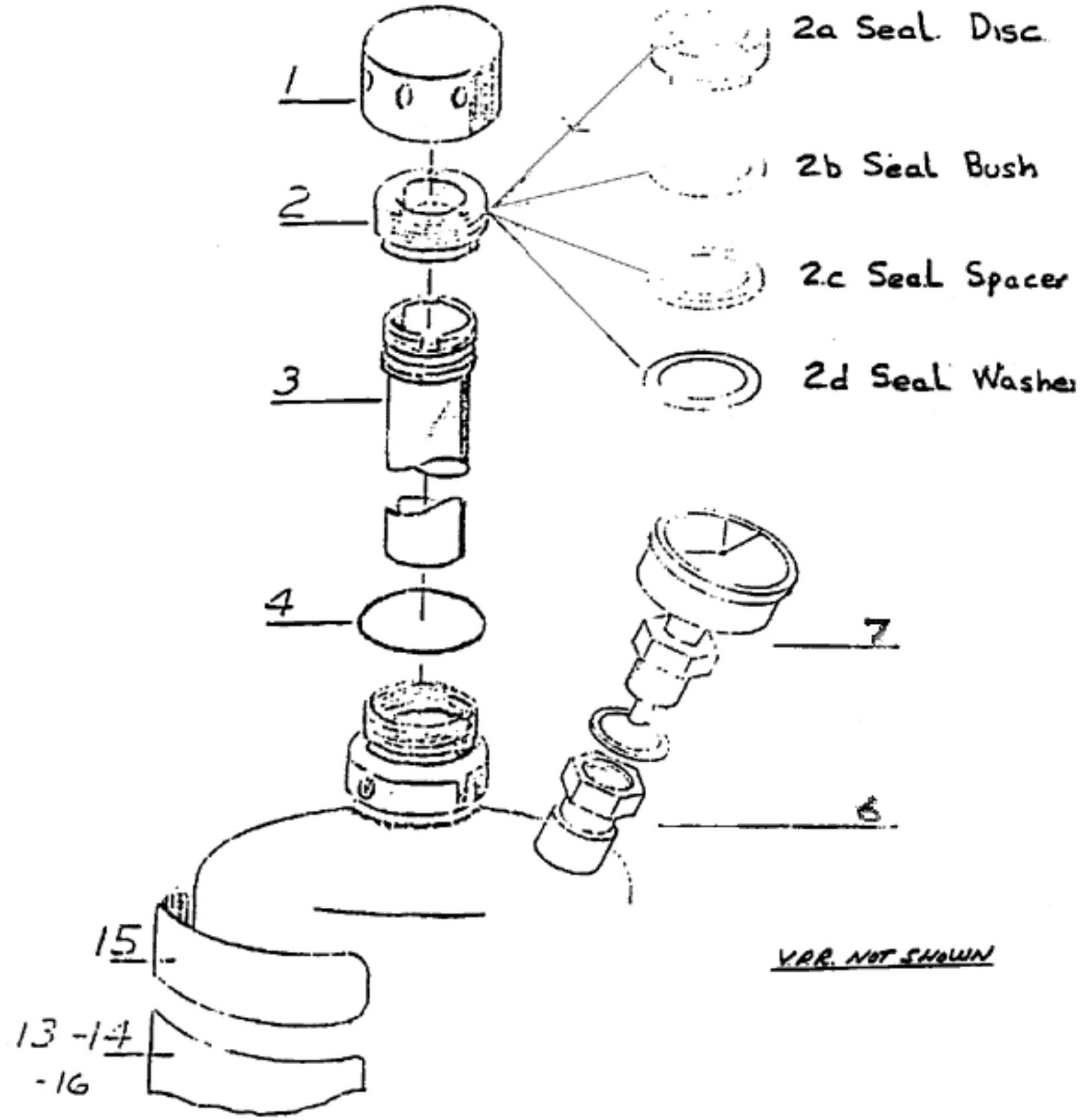





**MK III PARTS EXPLOSION**

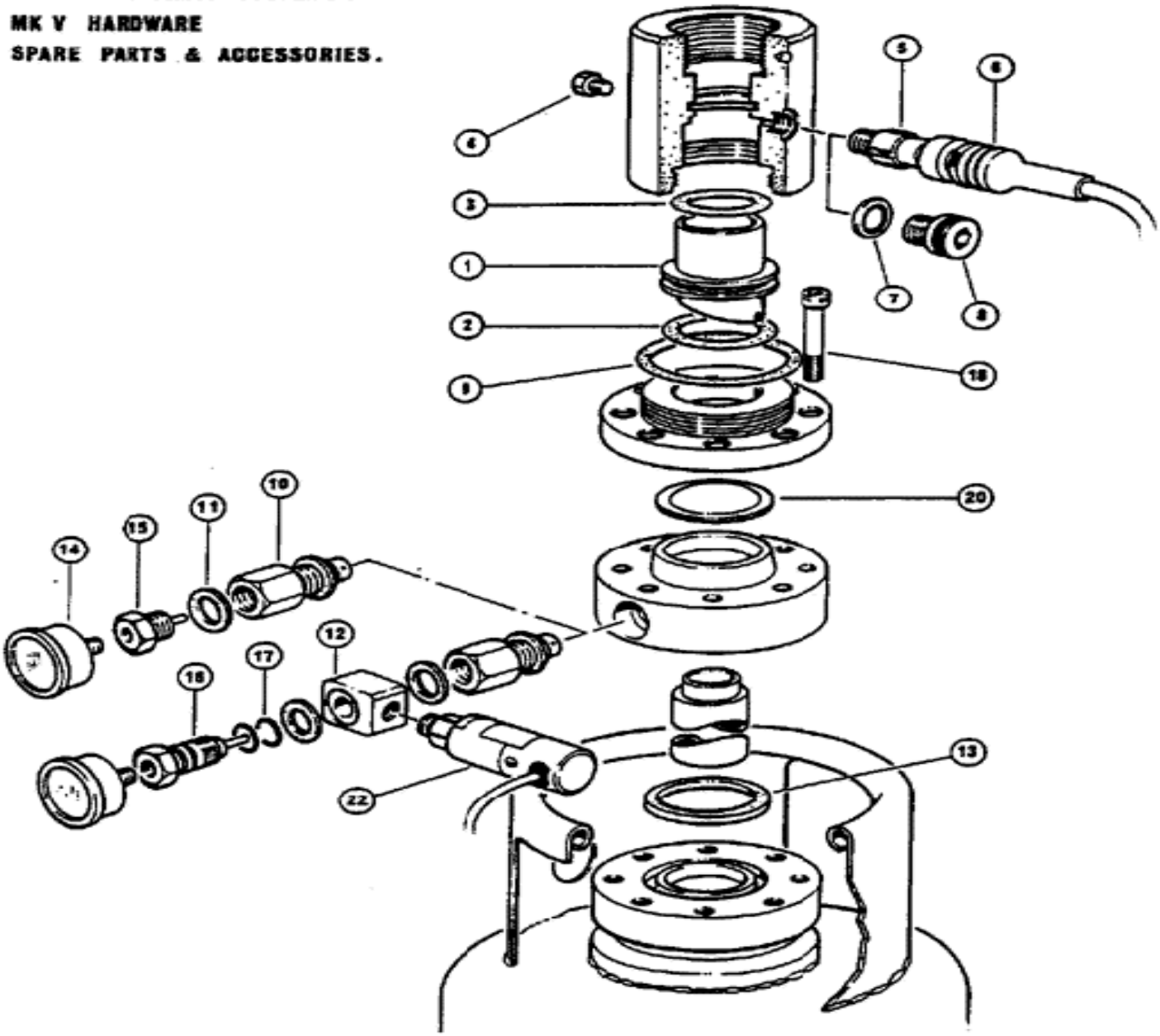



**MK IV PARTS EXPLOSION**



# HALON SYSTEMS

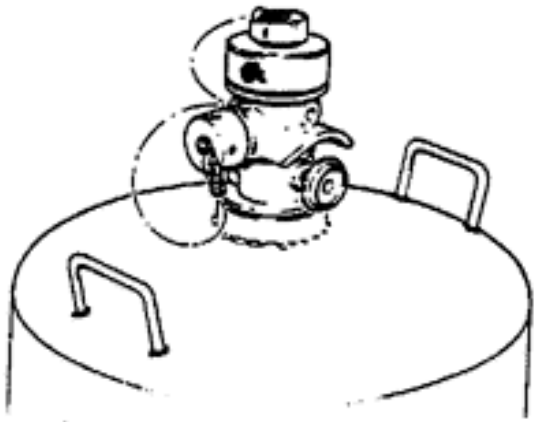
**INDUSTRIAL HALON SYSTEMS.**
**MK V HARDWARE**
**SPARE PARTS & ACCESSORIES.**




**EXPLODED VIEW SHOWING CYLINDER COMPONENTS DISCHARGE HEAD & ALTERNATIVE PRESSURE GAUGE ASSEMBLIES WITH & WITHOUT PRESSURE SWITCH.**

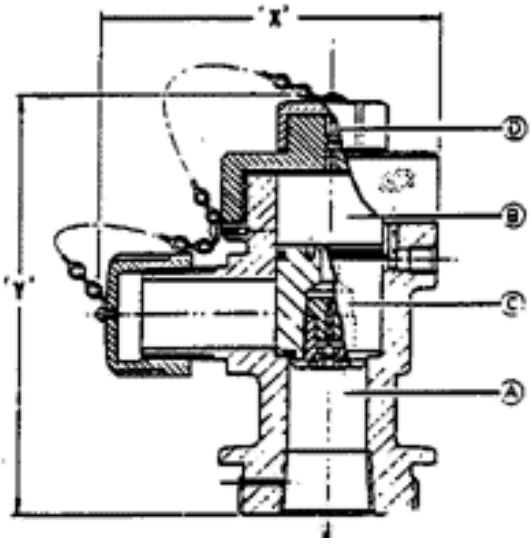
WORMALD
FIRE SYSTEMS

# 25mm AND 50mm 2500 kPa HALON HIGHFLOW VALVE AND CYLINDER ASSEMBLY



APPROXIMATE DIMENSIONS

| | 25mm | 50mm |
|---|---|---|
| X | 120 | 160 |
| Y | 150 | 200 |




**VALVE AND CYLINDER ASSEMBLIES**

**The Wormald cylinder and valve assemblies provide the agent, cylinder and valve assembly for both Halon 1301 and 1211 total flooding fire suppression systems They may be used singly or manifolded together to provide the required quantity of agent.**

**HIGHFLOW VALVES**

**Wormald Highflow Halon Valves are supplied as an integral part of the Halon cylinder assembly. The 25mm valve is used on the 25 and 48kg capacity cylinders and has a 25mm male NPT threaded pipe outlet. The 50mm valve is used on the 65 and 106kg capacity cylinders and has a 50mm male NPT threaded pipe outlet. The 25mm and 50mm highflow valves am of the differential pressure piston type. They are attached to the cylinder with a 2½- 12UN-2B thread with an O-Ring seal. Valve components are brass, making the valve inherently corrosion resistant. The outlet port and actuation connections are readily accessible for ease of installation and servicing. The valve assembly includes a safety relief device, a pressure gauge, connections for various ancillary equipment and transport caps. A syphon tube is permanently fitted to the valve.**

**The following actuators are suitable for use with the Highflow Halon Valves and fit to a threaded 1¼" - 18 UNEF-2B connection:**

A. **Pneumatic (Slave)**
B. **Electrical (24V DC Solenoid)**
C. **Manual-cable pull**

D. **Manual/Pneumatic**
E. **Multi-actuator**

**Refer to separate actuators data sheet for details.**

**The fire extinguishing agents used are Halon 1301 and Halon 1211. Both are colourless, odourless, non conductive gases. Halon is stored in the cylinders as a liquid under nitrogen superpressure, at 2500 kPa. Cylinders can be part filled with the required Halon quantity.**

## OPERATION

**Once a tank has been filled and pressurized. The valve is sealed by means of nitrogen overpressure introduced into Chamber B. This pressure propels the piston into the valve closed position and the pressure acting on the greater surface area of Chamber B than Chamber A produces a positive sealing force. A small bleed hole C through the piston ensures that the seal is maintained by equal pressure above and below the piston.**

**The valve is opened by venting the pressure from the upper chamber through the vent valve D. During this venting, a rubber ball in the bleed hole checks the gas flow from A to B and the tank pressure propels the piston into its upper position. Allowing maximum free passage to the flow.**

## DESIGN DATA

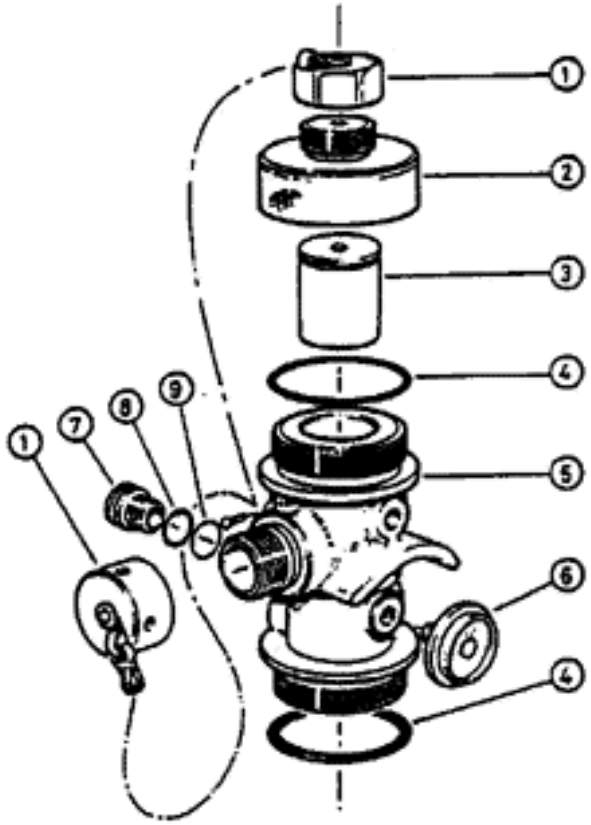
- **Agent: Halon 1301 or Halon 1211. Superpressurized with nitrogen.**
- **Working pressure: 2500 kPa at 21ºC. Maximum filling density of Halon 1301 1.065 kg/L.**
- **Design temperature:**
  - **20ºC to + 50ºC.**
- **Safety relief device: 5400 ± 300 kPa.**
- **Pressure drop:25mm Valve: 1.5m equivalent length of 25mm Schedule 40 pipe (includes outlet nipple).**
  **50mm Valve: 7.3m equivalent length at 50mm Schedule 40 pipe (includes outlet nipple).**

## CYLINDERS

**Wormald Highflow Halon cylinders are available in 25, 48, 65 and 106 kg capacities. They are of welded steel construction, and are designed, tested and inspected in accordance with Australian standard AS2470. Every cylinder is hydrostatically pressure tested to 6900 kPa, and carries a stamped plate with all cylinder details. Standard finish is yellow enamel # 356 to BS381C, however, zincsprayed and pointed, or galvanised finishes are available to order. Cylinders a complete with fitting handles and base skirt.**

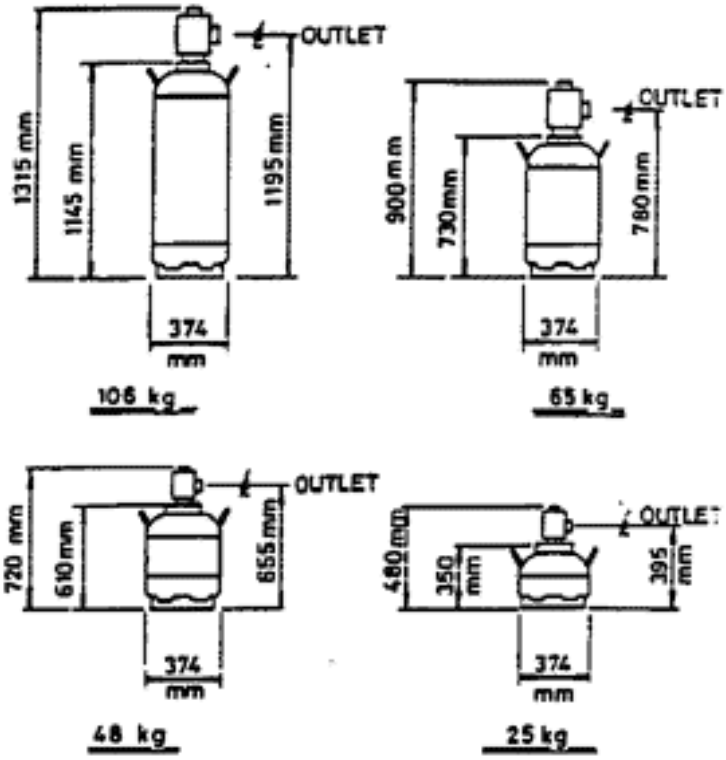
WORMALD
FIRE SYSTEMS

## HIGHFLOW VALVE — EXPLODED VIEW




1. SHIPPING/SAFETY CAP ASSEMBLY
2. CAP
3. SPOOL ASSEMBLY
4. 'O' RINGS
5. VALVE BODY
6. GAUGE
7. SAFETY DISC NUT
8. SAFETY DISC GOLD PLATED BRASS
9. SAFETY DISC WASHER

## CYLINDER DIMENSIONS




## CYLINDER BRACKET

(For use with Unistrut type channel and threaded rod)

| | NOMINAL CAPACITY | | | |
|---|---|---|---|---|
| CYLINDER SPECIFICATIONS | 25kg | 48kg | 65kg | 106KG |

| | | | | |
|---|---|---|---|---|
| HALON 1301 CAPACITY WITH 1.065kg/L FILL DENSITY AT 21ºC (kg) | 26.6 | 51.1 | 69.2 | 112.9 |
| HALON 1211 CAPACITY WITH 1.3kg/L FILL DENSITY AT 21ºC (kg) | 31 | 62 | 85 | 138 |
| WATER CAPACITY (NOMINAL) (kg) | 25 | 48 | 65 | 106 |
| TEST PRESSURE (kPa) | 6900 | 6900 | 6900 | 6900 |
| SUPERPRESSURE (MAX) AT 21ºC (kPa) | 2500 | 2500 | 2500 | 2500 |
| NOMINAL TARE MASS (EMPTY) (kg) | 28 | 45 | 55 | 79 |
| VALVE OUTLET SIZE | 1"NPT | 1"NPT | 2"NPT | 2"NPT |



**PRODUCT : HALON CYLINDERS - MKII,MK III, Mk IV, MK V HIGHFLOW**

**SUBJECT : RELIEVING, SUPERPESSURE & DECANTING**

**ORIGINAL ISSUE DATE : MAY 1987**

**It should be general policy to try to upgrade all Halon Systems to the Ansul - style Highflow type where possible. The major selling point here is that the removal, emptying, testing, refilling and reinstatement of the old cylinders is a major operation, which will have to be repeated every five (5) years subsequent to the initial ten (10) year inspection, in accordance with AS2030 - 1985 requirements.**

**MkII - MkIV valves and cylinders particularly should be replaced and their design and technology is approaching obsolescence. Mk I cylinders will NOT be refilled.**

**There are two ( 2) methods of decanting the range of Wormald Halon cylinders. The method used - depends on the type of container the Halon is being emptied into, the equipment available, and the efficiency required of the transfer.**

**METHOD 1:**

**BANNED**

**METHOD 2:**

**The cylinder can be emptied without first relieving the Nitrogen superpressure. Depending on the cylinder type, it may have to be inverted to allow the superpressure to force the liquid Halon out.**

**This method may be used when the Halon receiving vessels are only on limited volume, and-the extra pressure in the cylinder being emptie ensures maximum Halon transfer. This method tends to transfer a higher percentage of the Halon than Method 1.**

**METHOD 2:**

**2.1 CYLINDER DECANTING WHILST SUPERPRESSURISED**

**With this method, the nitrogen superpressure is not bled of f prior to decanting the liquid Hallon.**

**2.1.1 MKII Cylinders**

**(a) Install the filling bonnet (as supplied by Wormald Manufacturing) onto the top of the cylinder, ensuring, it is fully screwed onto the neck ring, and the valve closed.**

**(b) Place cylinder into a clamping device.**

**(C) Connect draining hoses to bonnet outlet valve, and to-the receiving vessel.**

**(d) Using a socket wrench or spanner assembly in the filling bonnet, turn anti-clockwise to release seal-disc.**

**(e) By opening all line valves slowly, Halon will flow from the superpressurised cylinder into the receiving vessel.**

**2.1.2 MKIII. MKIV, MKV Cylinders**

**(a) Connect special draining adaptors to the filler valve after first removing the pressure gauge**

**assembly (MkIV and MkV) or Cap (MkIII). The built-in ball-check valve should prevent excessive leakage until draining adaptor is screwed fully home.**

**(b) Connect draining hoses and valve to draining adaptor and to the receiving vessel.**

**(c) Carefully invert cylinder, and clamp securely.**

**(d) By opening all line valves slowly, Halon will flow from the superpressurised cylinder into the receiving vessel.**

### 2.1.3 Highflow Cy1inders

**(a) Clamp cylinder securely.**

**(b) Connect filling/draining adaptors to outlet connection, ensuring valve on adaptor is closed.**

**(c) Valve can be actuated against this closed valve. by depressing Schrader Valve at the top of the Halon valve.**

**(d) Connect draining hoses to adaptor connection and receiving vessel.**

**(e) Open line valves and Halon will flow from sup superpressuris cylinder into receiving vessel.**

**After the above steps, there should be very little Halon left in cylinder.**

**NOTES:**

**(i) Where possible the easiest and most economical results are achieved when a 1/2 ton or 1 ton cylinder is used as the receiving vessel.**

**(ii) To assist in Halon transfer, where possible the receiving vessel should be kept cool and below the level of the cylinder being decanted.**

**(iii) If a brine task or chiller unit is available, the Halon should be pumped through this to further aid transfer.**

**(iv) Transport caps should always be fitted where possible.**

**(v) Always provide maximum ventilation to filling/decanting area - DO NOT SMOKE whilst performing these operations.**

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