



Wanner International
and
ATEX
Directive 94/9/EC

**Covers - Category 2 Zone 1 and
Category 3 Zone 2 requirements**

Date of issue 9/07

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1. Wanner International and the ATEX Directive 94/9/EC

ATEX Directive 94/9/EC is a directive adopted by the European Union (EU) to harmonise the technical and legal requirements in the Member States for products intended for use in potentially explosive atmospheres. The Directive covers electrical and non-electrical equipment and became mandatory in July 2003 when adopted by the EU.

The Directives are known as **ATEX** from the French - **AT**mospheres **EX**plosibles.

Wanner International Ltd has worked with an outside specialist agency called **Intertek ETL SEMKO** in order to obtain **ATEX** Certification for Hydra-Cell pumps carrying out a comprehensive risk assessment and compiling the Technical File. Intertek ETL SEMKO is accredited by UKAS (the UK Accreditation Service) and authorised to carry out product safety testing and Certification of equipment under European Directives such as ATEX. See appendix 1 "Type Examination Certificate."

Hydra-Cell pumps are approved for use in **ATEX** environments - Category 2 zone 1- when installed with an oil level monitor unit or, if the pumped liquid is deemed to be inert or non-hazardous a flow meter can be employed to monitor the flow rate of the pump (see appendix 4a).

CE MARKING

Due to the changes made to the Machinery Directive 2006/42/EC all Hydra-Cell pumps are supplied with the CE mark on the pump manufacturers label.

Certificate Number:

ITS04ATEX11919 -

Category 2 Zone 1

Hydra-Cell **ATEX** Certification covers the supply from Wanner International of bare shaft pumps only and not complete pump and electric motor sets.



2. Operating Conditions

The normal operating environment is an indoor or outdoor above ground industrial environment in which flammable dust could be present.

The intended external ambient operating temperature range is (minus) -10°C to 40°C.

The intended internal operating temperature range is (minus) -10°C to 90°C.

This is the maximum temperature range for Hydra-Cell pumps with ATEX. Certain diaphragm materials have operating limits within this temperature range. Contact Wanner International for more information and assistance.

Wanner International has obtained Type Certification, for conditions outside the pump as follows:-

CE Ex II 2G & D outside T4 amb (max process temperature 90°C)

Group II (Zone 1), Category 2 G (gasses) & D (dust)

T4 135°C (auto ignition temperature)

By designing equipment suitable for use in Category 2 Zone 1 areas, operation in Category 3 Zone 2 area is also permitted.

Category 3 Zone 2 only - Where the end-user will take responsibility to ensure oil is always present in the pump hydraulic-end, then a simple 'oil level sight bowl' can be fitted (see appendix 8). The user must never start or continue running the pump when oil is not visible.

The pump is not intended to pump dusts but is intended for use in dust hazardous atmospheres.

3. Drive Motors

Hydra-Cell **ATEX** Certification covers the supply from Wanner International of bare shaft pumps only and not complete pump and electric motor sets.

The supplier of the drive motor and motor control system must provide over current and short circuit protection that is capable of shutting down the pump before the motor produces more than 85% of the input power limit of the hydraulic-end.

The input power limit can be calculated using the Hydra-Cell standard power requirements formula (see product specification sheets on website) at maximum speed and pressure for any given pump (see appendix 2).

This is necessary to ensure that the bearings are operating with a 25% safety margin, satisfying the explosion safety design concept described in clause 1.0.1 in the Technical File (see appendix 3).

4a. Oil Level Monitor Unit - Category 2 Zone 1

For **ATEX** compliant installations, the pumps must carry appropriate markings of conformity. The certification is based on the principle that a Hydra-Cell pump does not create a source of ignition while the lubricating liquid is present in the drive end of the pump.

ESTABLISHING THE REQUIRED PROTECTION LEVEL If the liquid to be pumped is flammable and therefore deemed hazardous, the monitoring oil bowl must be employed.

When pumping non-flammable liquids, it must be defined as either hazardous or non-hazardous as part of the end users risk assessment. If a liquid is defined as hazardous as part of that risk assessment due to it being corrosive or toxic, the monitoring oil bowl must be employed.

If the pumped liquid has been assessed to be as non-hazardous, the oil monitoring bowl is not required.

Zone (Outside of the pump)	Material being pumped	Measures required
1	Flammable	Monitoring Oil bowl
	Non-flammable but toxic / corrosive	
	Non-hazardous	Oil level site bowl And flow meter
2	Flammable	Oil level site bowl
	Non-flammable but Toxic / corrosive	Oil level site bowl
	Non-hazardous	Oil level site bowl



PUMPING NON-HAZARDOUS LIQUIDS If the pumped liquid is regarded as non-hazardous or inert but the pump is to be installed in an **ATEX** defined area (Zone 1), the working condition of the pump can be safely monitored using a flow meter to monitor the flow rate of the pump. The flow meter must be continually monitored and give the operator a signal if the flow rate of the pump drops more than 10% below the expected flow rate from the pump at the running speed. An oil sight bowl will be supplied and must be fitted to facilitate a visual check that the oil is present and monitor its condition.

PUMPING HAZARDOUS LIQUIDS For pumping liquids that are regarded as hazardous, whether they are flammable, toxic or corrosive, an oil level monitor must be used to continually monitor the oil level in the pump.

An **ATEX** approved Intrinsically Safe (IS) oil level monitoring device is available from Wanner International.

The Wanner 'Oil Level Monitor' or "Protective System" is mentioned and included in the **ATEX** Type Certification (See appendix 1).

This Type Certification allows us to offer our 'Protective System' with every Hydra-Cell **ATEX** pump without the need for additional certification.

ELECTROSTATIC DISCHARGE

The oil level monitor has a top and bottom support plate made of Aluminium and a clear Acrylic sight bowl. Reference is therefore made to an extract from EN 13463-1:2001 (E) Section 7.4.4 in order to verify that the exposed area of acrylic is within the recommendations for non-conductive parts. (see appendix 7).

ATEX - INTRINSICALLY SAFE (IS) CIRCUIT

The two Low-level switches must be wired independently to their own individual IS Barrier circuit; whilst the two High-Level switches can be wired in series (or parallel) to a common IS Barrier circuit. The Low-level switches are the most critical to ensure liquid is always present in the pump housing.

Accordingly, **ATEX** Regulations demand that all 'critical sensors' are duplicated; hence two switches must be employed. However, the High-level switches are not so critical and simply prevent over fill and spillage of liquid from the oil reservoir bowl, therefore one switch is effectively redundant and can be used as a spare in the event of a switch failure (see appendix 5 "Approved circuit drawing").

All switches should operate from a normally closed position -

LL - low level opens when oil level decreases.

LH - high level opens when oil level rises

All switches should operate from a normally closed position -

Float level switch specs - "Voltage Free" switches held in place by a 'Noble metal' magnet (normally closed position).

Type Reed switches 30VA rating SPST with Rhodium contacts, SS-316 stem.

No current is required to operate switch. When magnet moves away (due to oil level change) switch will open indicating a fault.

4b. Oil Level Sight Bowl - Category 3 Zone 2

This category covers areas where an explosive atmosphere is less likely to occur and does not demand that an automatically actuated "protective system" be installed. Accordingly, a simple 'oil level sight bowl' can be fitted (see appendix 8).

In this case the end-user must take responsibility to ensure oil is always present in the pump hydraulic-end by physically monitoring the level in the sight bowl.

ELECTROSTATIC DISCHARGE

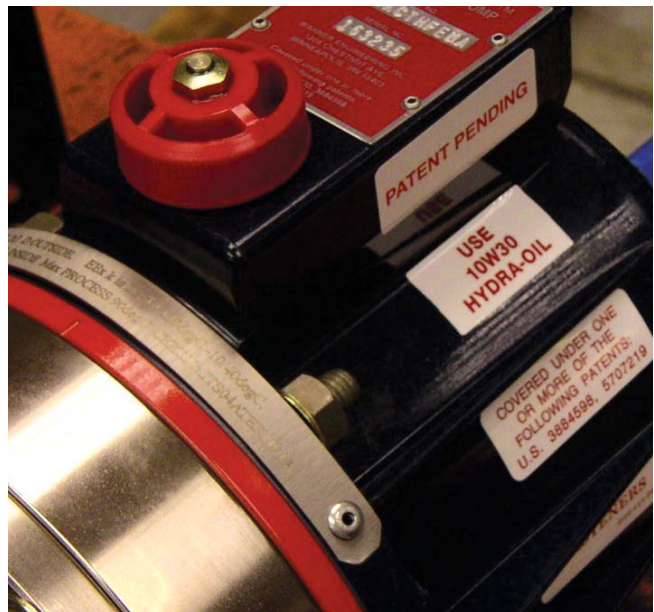
The 'oil level sight bowl' has a top and bottom support plate made of Aluminium and a clear Acrylic sight bowl. Reference is therefore made to an extract from EN 13463-1:2001 (E) Section 7.4.4 in order to verify that the exposed area of acrylic is within the recommendations for non-conductive parts (see appendix 7).

5a. Markings of Conformity - Category 2 Zone 1

All **ATEX** nameplates are fixed via pop rivets to the main pump housing. Material is stainless steel plate with markings clearly engraved. The pump's unique serial number and model configuration is stamped onto the standard nameplate during manufacture before supply.

ATEX nameplates contain following markings:

CE 2004 Ex II 2G D OUTSIDE
EEx k ia IIB T4 130°C -10 / 40°C
II 3G INSIDE
Max PROCESS 90°C
CERT.No. ITS04ATEX11919



Depending on the Hydra-Cell pump Series supplied then a particular design of nameplate is fitted (see following drawing references).

WI-ATEX-1035 3 / 4 / 10 / 12 / 15 / 17 / 25 / 35 Series

WI-ATEX-2021 20 Series markings

WI-ATEX-2221 20 Series support block

5b. Markings of Conformity - Category 3 Zone 2

All **ATEX** nameplates are fixed via pop rivets to the main pump housing. Material is stainless steel plate with markings clearly engraved. The pump's unique serial number and model configuration is stamped onto the standard nameplate during manufacture before supply.

ATEX nameplates contain following markings:

CE 2004 Ex II 3G D OUTSIDE
EEx k ia IIB T4 130°C -10 / 40°C
II 3G INSIDE
Max PROCESS 90°C

Depending on the Hydra-Cell pump Series supplied then a particular design of nameplate is fitted (see following drawing references).

WI-ATEX-1035Z2 3 / 4 / 10 / 12 / 15 / 17 / 25 / 35 Series

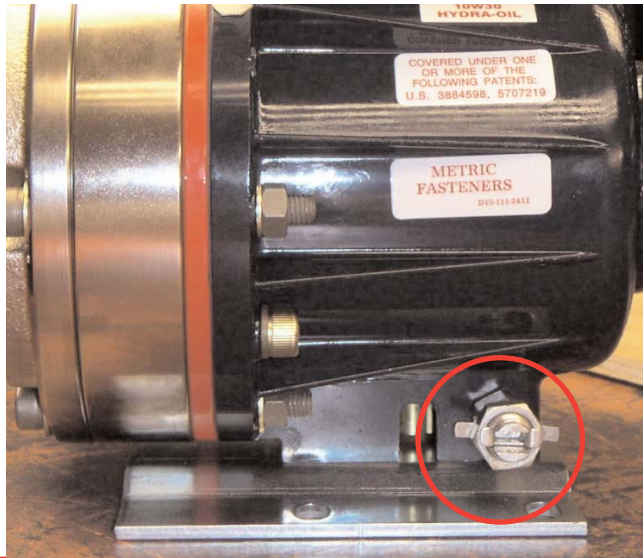
WI-ATEX-2021Z2 20 Series markings

WI-ATEX-2221 20 Series support block

6. Earthing / Grounding

An earth stud is fitted to each Hydra-Cell **ATEX** certified pump and should be connected to ground during installation.

Every Hydra-Cell **ATEX** certified pump, with Oil Level Monitor or Oil Level Sight Bowl mounted in position, is tested for earth continuity before despatch to the customer.



EARTH CONTINUITY CHECKS & PROCEDURE

Earth Continuity Device used:

Portable Appliance Tester - PAT 5001;
Equipment Class 1 Ser. Nr. 003401

Specifications: mains 230v 50Hz max power 250 VA Fuse 2 amps

Checking procedure.

1. Cable 'A' is clipped to the top of the oil bowl metal casing
2. Cable 'B' is connected to the earth stud, that is screwed into the main body of the pump.
3. These cables are also plugged into the PAT device (see appendix 7).
4. The 'earth bond' is then measured on the deflection meter, when the red earth bond button is depressed on the PAT device (see appendix 7.1).
5. Values of below 0.1 ohms can be expected and as such are acceptable. The actual value should be recorded against each pumps unique Serial No.

7. Pumpable Materials

Preventing the formation of explosive atmospheres both within the pump and external to it is not within the control of Wanner International. It is the users that are responsible for ensuring that pumps are not allowed to pump potentially explosive atmospheres for prolonged periods or as part of the normal operation.

The chemicals to be pumped are predefined by the user and outside of the control of Wanner International. However, the following is a list of material categories that are considered to be suitable for use in a Hydra-Cell pump. These pumps are designed to handle flammable liquids and other liquid chemicals.

Acetone	Gasoline
Acetate	Heptane
Ethanol	Propylene Oxide
Ethylene	Pentane
Methyl Ethyl Ketone	Kerosene
Butane	Benzene
Turpentine	Pitch Oil
Stoddard Oil	Propanol
Xylene	Toluene
Methanol	Tall Oil
White Spirit	Degassed Crude Oil
N-Hexane	Lubricating Oil

Please note: Wanner International must be informed in writing if other chemicals are likely to be involved. Accordingly an 'Application Questionnaire' should be completed and returned to Wanner International with details of the process liquid.

Hydrogen Peroxide, which reacts exothermically with many oils is not listed and should **NOT be pumped.**

Mixing of corrosive and or aggressive chemicals should be avoided.

Hydrogen Sulphide H_2S reacts adversely with SS-304 and 316. Care must be taken when selecting materials from Hydra-Cell's standard options.

8. Maintenance

As part of the regular maintenance procedure the following routine checks must be made.

Please refer to the Hydra-Cell Installation / Service Manual and supplements, for more detailed instructions on maintenance and checking methods.

1. Wanner Oil Level Monitoring Unit - check oil level periodically.
 2. Wanner Oil Level Monitoring Unit - check is functioning as intended.
 3. Wanner Oil Level Sight Bowl - check oil level daily.
 4. Pressure relief / by-pass valve is functioning as intended.
 5. All head and casing bolts are secured (refer to torque values).
 6. Check for electrical earth continuity.
 7. Check the integrity of the external shaft seals and pump head O-rings.
 8. Check the hydraulic-end to determine whether replacement bearings are required.
-

9. General Notes

- Lubricating oil should be changed in accordance with guidelines stated in the pump Installation / Service manual. The type of oil recommended and the frequency of oil change will vary in accordance with the pump materials of construction, the model, the duty, speed and pressure, and liquid temperature.
- Hydra-Cell Pumps are not suitable for total immersion in liquid.
- Only genuine replacement parts and mechanical components must be used, because only genuine parts will have the chemical and mechanical properties that have been developed to achieve explosion safety.

Appendix 1



1. **TYPE EXAMINATION CERTIFICATE**

2. **Equipment or Protective System Intended for use in Potentially Explosive Atmospheres Directive 94/9/EC**

3. Type Examination Certificate Number: **ITS04ATEX11919 Issue 2**

4. Equipment or Protective System: **HYDRA-CELL RANGE OF PUMPS**

5. Manufacturer: **WANNER INTERNATIONAL LTD**

6. Address: **8/9 Fleet Business Park, Sandy Lane, Church Crookham, Hants, GU52 8BF**

7. This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8. Intertek Testing and Certification Limited, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results together with a copy of the Technical Dossier are held in file Ref 03010842

9. Compliance with the Essential Health and Safety Requirements has been assured by compliance with EN13463-1 and 13463-8, EN5014 and EN50020 except in respect of those requirements referred to at item 18 of the Schedule.

10. If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

11. This Type Examination Certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

12. The marking of the equipment or protective system shall include the following:-



II 2 G D Outside, II 3 G 130°C Inside

EEx k ia IIB T4 130°C T amb -10°C to 40°C maximum process temperature 90°C



Intertek Testing & Certification Limited
Intertek House, Cleeve Road, Leatherhead, Surrey, KT22 7SB
Tel: +44 (0)1372 370900 Fax: +44 (0)1372 370977
<http://www.uk.intertek.com>
Registered No 3272281 Registered Office: 25 Savile Row London W1X 1AA

A T Austin
Certification Engineer
7th April 2011

This certificate may only be reproduced in its entirety and without any change, schedule included and is subject to Intertek Testing and Certification Conditions for Granting Certification.

Sheet 1 of 2



13. **Schedule**

14. **TYPE EXAMINATION CERTIFICATE NUMBER ITS04ATEX11919 Issue 2**

15. **DESCRIPTION OF EQUIPMENT OR PROTECTIVE SYSTEM**

HYDRA-CELL RANGE OF PUMPS comprising Series 3, 4, 10, 12, 15, 17, 20, 25 and 35 each pump consists of a wet pump chamber and an oil filled gear chamber (hydraulic end). An intrinsically safe (IS) oil level system is used to ensure that the hydraulic end is completely filled with oil. The IS barrier parameters and connection details are shown in the Installation Instructions

An external earthing facility is provided.

The Labels to be applied to each range are:

Drawing WI-ATEX-1035 for Series 3, 4, 10, 12, 15, 17, 25 and 35

Drawing WI-2021 for Series 20

16. **FILE REFERENCE**

Intertek Ref 03010842

17. **SPECIAL CONDITIONS FOR SAFE USE**

None

18. **ESSENTIAL HEALTH AND SAFETY REQUIREMENTS (EHSR'S)**

The relevant EHSR's have been identified and assessed for compliance supporting information is held in the Technical Dossier

19. **DOCUMENTS**

Document	Issue	Date	Description
Product Description Data Sheets	-	3/03	Industrial Pump Selection Manual

20. **VARIATION ONE**

Removal of the requirement to fit oil level monitoring when used to pump non-flammable liquids. The requirement to maintain a regular manual level check remains as identified in the manual.

Intertek Testing & Certification Limited
Intertek House, Cleeve Road, Leatherhead, Surrey, KT22 7SB
Tel: + 44 (0)1372 370900 Fax: +44 (0)1372 370977
<http://www.uk.intertek-eltsemko.com>
Registered No 3272281 Registered Office: 25 Savile Row London W1X 1AA

This Certificate is the property of Intertek Testing and Certification Ltd
and is subject to Intertek Testing and Certification Conditions for Granting Certification.

Sheet 2 of 2

Appendix 2

MAX PRESSURE VALUES ALL MODELS

Models (any prefix letter)	Discharge Pressure	Inlet Pressure
20 Series	100 bar 70 bar max G20/F20 17 bar max non-metallic heads	7 bar
3 Series	83 70 bar max X-cams 17 bar max non-metallic heads	17 bar
4 Series	170 bar	34 bar
10/12 Series	70 bar 17 bar max non-metallic heads	17 bar
15/17 Series	170 bar	34 bar
25 Series	70 bar 17 bar max non-metallic heads	17 bar
35 Series	83 bar	17 bar

Appendix 3

Manufacturer's approach

Wanner Hydra-Cell Industrial Pump Range for ATEX Group II Categories 2 & 3

Preliminary observations.

- A.** Technological knowledge which can change rapidly must be taken into account as far as possible and be utilised immediately.
- B.** For the devices referred to in articles 1 (2) the essential requirements shall apply only in so far as they are necessary for the safe and reliable functioning and operation of these devices with respect to the risk of explosion.

1. COMMON REQUIREMENTS FOR EQUIPMENT AND PROTECTIVE SYSTEMS

1.0 General requirements

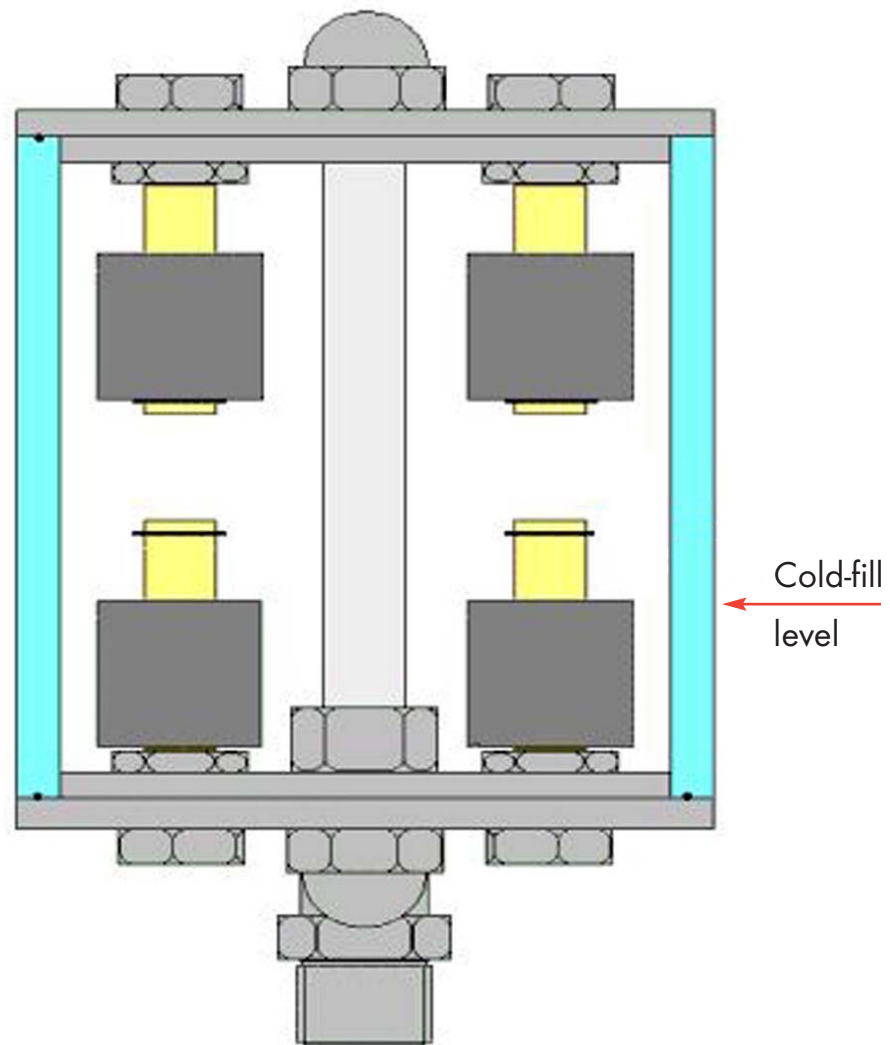
1.0.1 *Principles of integrated explosion safety*

Equipment and protective systems intended for use in potentially explosive atmospheres must be designed from the point of view of integrated explosion safety.

In this connection the manufacturer must take measures:

- above all if possible, to prevent the formation of explosive atmospheres which may be produced or released by equipment and by protective systems themselves.
- to prevent the ignition of explosive atmospheres, taking into account the nature of every electrical and non-electrical source of ignition.
- Should an explosion nevertheless occur which could directly or indirectly endanger persons and, as the case may be, domestic animals or property to halt it immediately and/or to limit the range of explosion, flames and explosion pressures to a sufficient level for safety

Appendix 4



Approximate capacities:
To cold-fill level 180ml
To Low cut-out 100ml
To High cut-out 350ml

Appendix 5 - Category 2 Zone 1 requirements

Intrinsically Safe, approved electrical connection drawing. Please note Wanner does not supply any electrical box or electrical equipment... only the cables connected to the level switches.

contacts normally closed

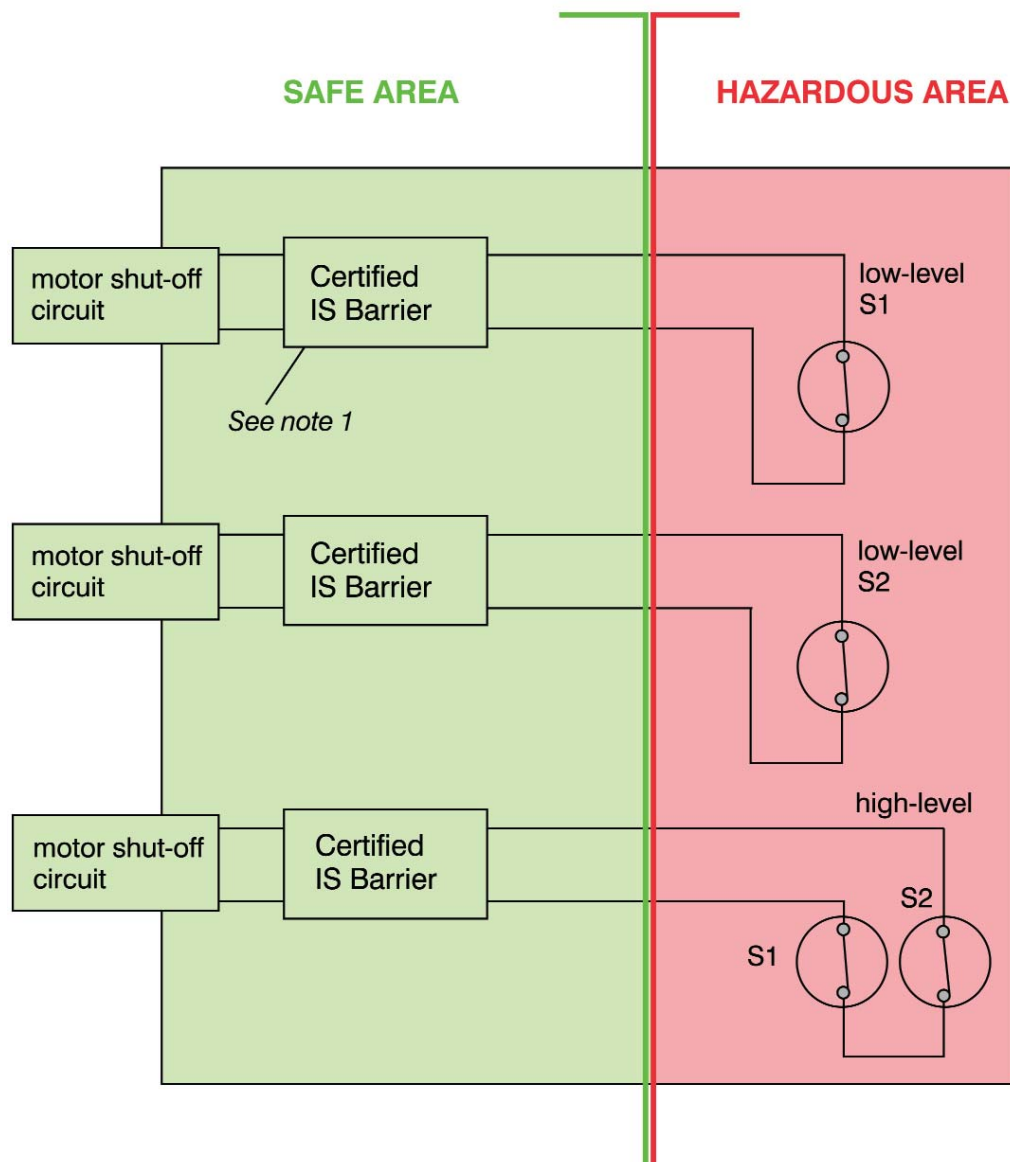
$U_i = 15\text{v}$ $I_i = 300\text{mA}$ $P_i = 1.2\text{w}$

IS - Intrinsically **S**afe Installation Diagram in accordance with EN50039

Note 1. Any single channel shunt Zener diode safety barrier, certified by an EEC approved body to (EE ia) IIC and having the following or lower output parameters:-

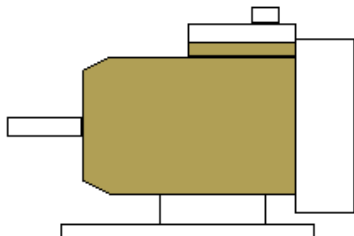
$U_o = 15\text{v}$ $I_o = 150\text{mA}$ $P_o = 0.56\text{w}$

The output current of the barrier must be limited by a resistor "R" such that $I_o = U_o/R$.
All barriers must have same polarity.

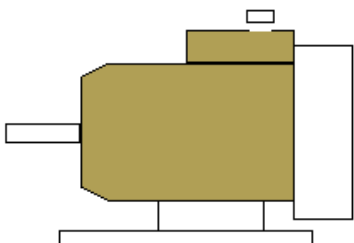


Appendix 6

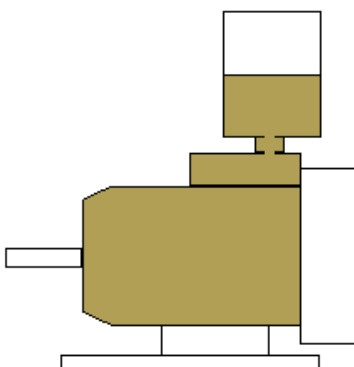
Suggested procedure for fitting and filling oil reservoir bowl



1. Typical mean oil level in pump reservoir.

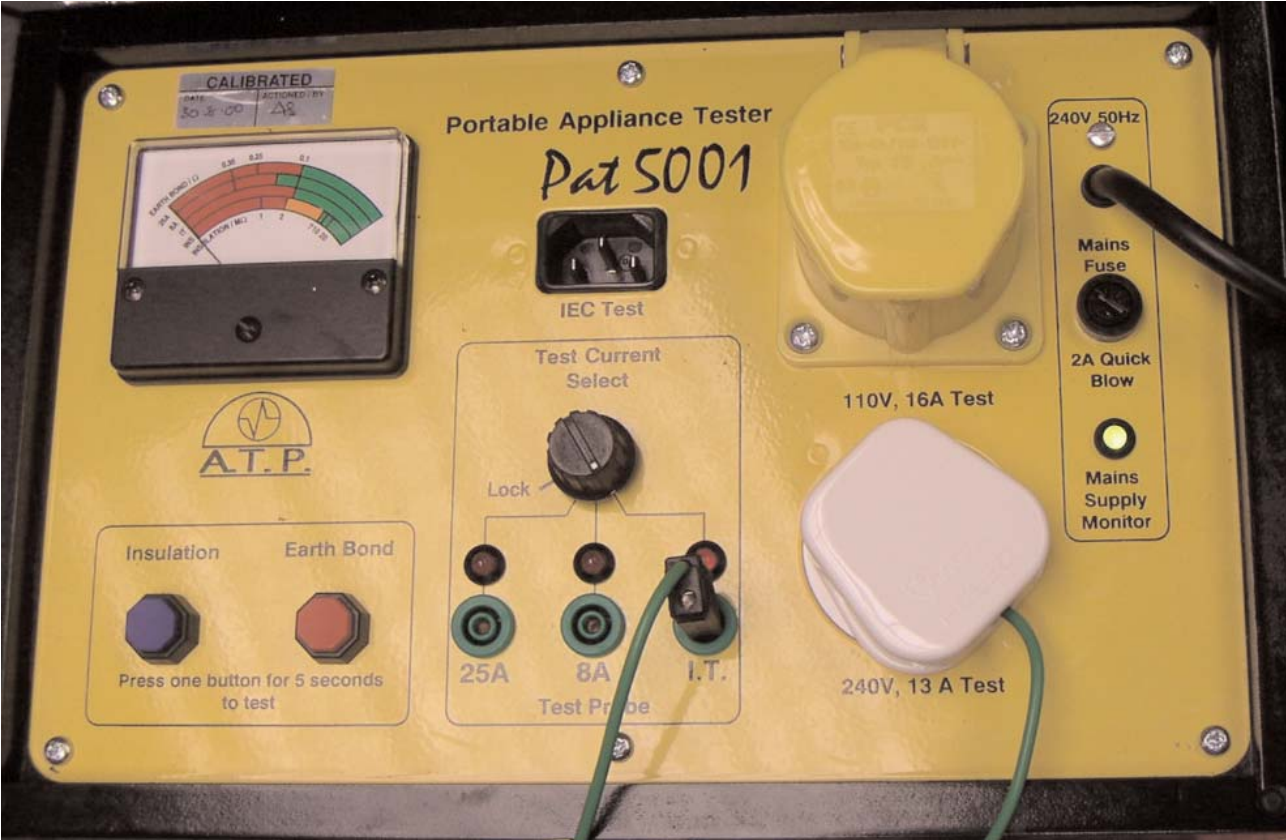


2. When fitting oil reservoir bowl, remove red oil filler cap, fill the pump housing to max. capacity and replace with oil level monitor unit WI-ATEX-LS01 or A01-116-3400. Screw into pump body until sealed against O-ring.



3. Fill to level indicated on the oil level label. Note this is a guide only and allowance should be made for expansion and contraction of oil during operation.

Appendix 7



Appendix 7.1



Appendix 8 - Oil Reservoir Sight Bottles



Oil reservoir assemblies easily screw in where the oil fill cap is located on all Hydra-Cell pump models D/G-03 and larger. Pumps equipped with an oil reservoir provides more volume for oil expansion and allows for quick visual monitoring of the oil level and its condition.

Three different reservoir bottles are available. The low-level floatswitch in the 16-oz bottle outputs a low voltage signal in the event the oil level in the pump housing drops.

Oil Reservoir Sight Bottles	Part Number
16 oz (474 ml) volume sight bottle	A01-116-3400
16 oz (474 ml) volume sight bottle with low-level float switch	A01-116-3410
4 oz (119 ml) volume sight bottle	A01-116-3500





WANNER INTERNATIONAL LTD.

8-9 Fleet Business Park, Sandy Lane, Church Crookham, Hampshire, UK. GU52 8BF
Telephone: +44 (0) 1252 816 847, Facsimile: +44 (0) 1252 629 242
e-mail: sales@wannerint.com web: www.wannerint.com

WANNER PUMPS LTD.

Room 1111, 11/F New Kowloon Plaza, 38 Tai Kok Tsui Road, Tai Kok Tsui,
Kowloon, HONG KONG
Tel: (852) 3428 6534, Fax: (852) 3188 9145 e-mail: jloo@wannereng.com

WANNER ENGINEERING, INC.

1204 Chestnut Avenue, Minneapolis, MN 55403, USA.
Tel: 612-332-5681, Fax: 612-332-6937
e-mail: phage@wannereng.com web: www.WannerEng.com
