HYDRAULIC TOOLS FOR THE MAINTENANCE OF WATER AND GAS NETWORKS

ROAD MAINTENANCE
CIVIL PROTECTION
UNDERWATER WORKS
INDUSTRIAL & OEM
The production of DOA Srl is in constant evolution, DOA Srl reserves the right to make modifications or change configuration, characteristics and functions of products at any time without previous notice or obligations on products already sold.
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WHY HYDRAULICS?

**POWER & PRODUCTIVITY**
The power to weight ratio of hydraulic tools is unbeatable! A comparative test will immediately demonstrate this advantage that means increased productivity and less fatigue for the operators.

**TRANSPORTABILITY & ECONOMY**
The group power pack/tool is very compact and easy to transport, the fuel consumption of power packs is largely less than the one of air compressor, the power pack is lighter and can easily be transported by the smallest vehicles, can be positioned on job site occupying minimal space and without troubling operations and traffic, it does not have the typical problems associated with air compressors such as needs of brakes, lighting, car plates, hooks, lifting, parking, etc.

**A BETTER WAY TO WORK IN TOTAL SAFETY**
No other equipment either electric, gasoline, or pneumatic can solve together all the problems related to the urban maintenance of underground pipes. The modern utilities organisations require powerful, productive, reliable, easy transportable equipment that has to give maximum guarantee of safety for operators. Difficult to obtain all this from conventional equipment, hydraulics is the synthesis and the DOA range is the definitive “point by point” solution. **Hydraulics is implicitly free of electric shock hazard**, often the operators work inside trenches with feet in the water and mud, this is a dangerous condition prohibited by law if are used electric single phase tools that in case of contact with water can cause fatal accidents, hydraulic tools can work in total immersion in water without problems of functionality and in total safety.
THE RANGE
DOA has the largest range in its type, no one has the same number of tools and solutions designed for the maintenance of underground pipes and for general urban works, our catalogue is constantly increased with new tools anticipating the operators necessity guaranteeing safety and productivity.

DOA IS ALWAYS A STEP AHEAD!

QUIETNESS - NO FROZEN MOISTURE IN WINTER
Absence of open exhaust gives a quietness that is unmatched by other tools type. In winter operations or at low temperatures hydraulic tools guarantee absence of frozen moisture, typical limit of the air tools. Hydraulics also give the advantage of not having pressure accumulation, being the oil incompressible it cannot cause explosions of tanks and hoses etc.

VERSATILITY AND LONG OPERATIVE LIFE OF TOOLS
Hydraulic tools can be powered also by the circuit of mini excavators, trucks and all vehicles with a sufficient hydraulic circuit, the DOA multi power groups TRIDENT and HYDROBOX are a synthesis of simplicity, economy, functionality and are ideal for crews that operates in the utilities maintenance. The tools “longevity” is another great advantage, hydraulic tools have a small number of components that are always bathed and lubricated by the oil, an hydraulic tool has a working life that is at least 20 times longer then other tools type.

MULTI POWER GROUPS FOR TRUCKS
DOA multi power groups for trucks: INTELLIPOWER, TRIDENT, HYDROBOX allow to significantly increase the use of the trucks and vans transforming them from normal transportation vehicles in real working equipment to obtain hydraulic, electric and pneumatic energies from the engine of trucks, the advantages in terms of reduction of weight and volumes transported, the versatility, the economy, the convenience and safety are obvious and concrete.
Micro power pack with 6 Hp gasoline engine – recoil start designed to guarantee the minimum weight and easy transportability.

The machine is available in two configurations of hydraulic power: 20 L/min @ 95 Bar or 12 L/min @ 160 Bar. These characteristics allow to power some tools of the class “C” of EHTMA standard or other type of hydraulic equipment.

Many components are common to larger power packs such as the stainless steel frame, all the parts suspended on anti vibration shock mounts, the quick couplers installed on impact free swivel fitting, high efficiency oil cooling system that guarantees the best performances even in the hottest climate and with the more demanding applications. Agile and robust SCORPION is ideal in the utilities maintenance, in general applications with hydraulic tools and in all works where are needed power and transportability.

TECHNICAL CHARACTERISTICS

| Lightweight Kg | 42 |
| DIMENSION cm LxWxH | 60 x 40 x 43 |
| FLOW L/min | 20 or 12 |
| PRESSURE Bar | 95 - 160 |
| ENGINE | Benzina 6 HP mono |
| STARTING | Strappo |
| ACCELERATION | Manual |
| HOSES LENGTH std | 7 mt |

Aspid 20 L/min @ 140 Bar
Engine 12 Hp monocylinder - Starting battery or recoil

Super Aspid 30 L/min @ 140 Bar
Engine 13 Hp monocylinder - Starting battery or recoil

Super Aspid B 30 L/min @ 140 Bar
Engine 14 Hp monocylinder - Starting battery or recoil

Aspid is a three models power packs range with gasoline engine that have same size and minimal difference in weight due to the various engines installed and to the hydraulic output power.

These machines have excellent transportability, robustness, quietness, reliability and a superior construction quality thanks to the stainless steel frame, all parts suspended on anti vibration shock mounts, quick couplers installed on impact free swivel fitting, high efficiency oil cooling system that guarantees the best performances even in the hottest climate and with the more demanding applications.

For these characteristics the Aspid range is the best selling and those more commonly used in the maintenance of underground pipes, in the civil protection and in all application where is necessary a professional hydraulic power supply.

Aspid can be supplied with different characteristics of hydraulic power on customer specification.
SUPER RAPTOR
SUPER RAPTOR DUAL

38 L/min @ 140 Bar - (30 L/min @ 180 Bar)
Gasoline engine 18 Hp - single tool

SUPER RAPTOR MONO

SUPER RAPTOR is a hydraulic power pack with 18 Hp twin cylinder gasoline engine, the machine is available on request with flows from 20 to 38 L/min and pressures up to 210 Bar depending on the pump size installed (example 30 litres @ 175 Bar or 38 litres @ 140 Bar).

It can operate with hydraulic tools of the category C-D-E of EHTMA standard.

SUPER RAPTOR is for function and construction one of the best machine on the market, for its characteristics it is ideal in the maintenance of underground pipes, in the civil protection, in powering high flow hydraulic tools and in all application where is necessary a professional hydraulic supply. AVAILABLE WITH DIFFERENT HYDRAULIC POWER DEPENDING ON REQUEST.

SUPER RAPTOR DUAL

SUPER RAPTOR DUAL is a twin tool hydraulic power pack with 18 Hp twin cylinder gasoline engine.

The machine has double possibility of hydraulic supply: or two hydraulic circuit at 19 L/min each or a single circuit at 38 L/min with a maximum pressure of 140 Bar. This characteristics allows to operate at the same time with two hydraulic tools of C group or with a single one of the E group of EHTMA standard.

The engine acceleration can be fixed and also automatic.

The selection of the type of flow and acceleration can be done in a while through comfortable levers.

The other characteristics are the same of SUPER RAPTOR MONO.

AVAILABLE ALSO FOR HYDRAULIC POWERS DEPENDING ON THE REQUEST OF THE CUSTOMER.

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>WEIGHT Kg</th>
<th>110 Mono - 118 Dual</th>
<th>DIMENSION cm LxWxH</th>
<th>85 x 60 x 65</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLOW L/min Mono</td>
<td>20 - 30 - 38</td>
<td>PRESSURE Bar</td>
<td>140 (200 adjustable)</td>
</tr>
<tr>
<td>FLOW L/min Dual</td>
<td>19+19 (38 united)</td>
<td>ENGINE</td>
<td>Gasoline 18 Hp TWIN</td>
</tr>
<tr>
<td>START UP</td>
<td>Recoil - Battery</td>
<td>ACCELERATION</td>
<td>Automatic or Manual</td>
</tr>
<tr>
<td>HOSES LENGTH std</td>
<td>7 mt</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MANTA HYDRAULIC POWER PACK WITH GENERATOR

30 L/min @ 140 Bar - 2,2 Kva 115 - 230 Volt - Gasoline engine 14 Hp

MANTA IS THE ONLY HYDRAULIC POWER PACK ON THE MARKET WITH ELECTRIC GENERATOR 2.2 KVA - 230 V

The double function makes MANTA the most versatile machine of its kind and adapts it to any situation being able to operate with most of the hydraulic and electrical tools. The hydraulic or electric functioning is selectable immediately by using a lever. Power sources can be used one at a time (not together). Like all the DOA power packs it has high quality components, the frame of stainless steel, the components are mounted on elastic anti-vibration and anti-noise shock mounts, quick couplers are installed on impact free swivel joints. The efficient cooling system of the oil assures maximum performance even in hotter climates.

MANTA is for construction and function the best machine in its kind. Its use is ideal for the maintenance of urban networks, for the civil protection and for all applications where are needed hydraulic and electric power.

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>WEIGHT Kg</th>
<th>95</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLOW L/min</td>
<td>30</td>
</tr>
<tr>
<td>PRESSURE Bar</td>
<td>140</td>
</tr>
<tr>
<td>ELECTRIC POWER</td>
<td>2,2 KVA - 50 Hz two electrical outlet SHUCO e CE</td>
</tr>
<tr>
<td>ENGINE</td>
<td>Petrol 14 Hp</td>
</tr>
<tr>
<td>START UP</td>
<td>Recoil - Battery</td>
</tr>
<tr>
<td>ACCELLERATION</td>
<td>Automatic</td>
</tr>
<tr>
<td>HOSES LENGTH std</td>
<td>7 mt</td>
</tr>
</tbody>
</table>

Generator detail
NITRO is a hydraulic power pack with 23 HP engine designed to power tools and hydraulic equipment with a high flow or pressure necessity. NITRO can be delivered with one or two parallel circuits or with different hydraulic power according to customer specifications, example: 50 L/min @ 140 Bar, or 38 L/min @ 200 Bar or two flows: one 20 L/min and the second one 30 L/min that can be added having one single circuit of 50 L/min @ 140 Bar. The large capacity oil tank and the double radiator cooling system guarantee ideal hydraulic conditions even in the more demanding applications. The chassis can be “skid” type (in the illustrations) or with wheels and handles like the other power packs. The typical use is to drive heavy duty hydraulic equipment like drilling equipment, big water pumps, powering underwater tools and in all applications where is need a professional hydraulic supply.

NITRO D is a hydraulic power pack with 23 HP twin cylinder Diesel engine Lombardini / Kohler. Dimension, hydraulic components and look are the same as the gasoline model. The weight is Kg 172.

### TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th></th>
<th>GASOLINE</th>
<th>DIESEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>WEIGHT DRY Kg</td>
<td>210</td>
<td>222</td>
</tr>
<tr>
<td>DIMENSION cm LxWxH</td>
<td>95 x 60 x h 65</td>
<td></td>
</tr>
<tr>
<td>FLOW L/min</td>
<td>single circuit 10 - 60 (on customer specification) double circuit (on customer specification)</td>
<td></td>
</tr>
<tr>
<td>PRESSURE Bar</td>
<td>100 - 210</td>
<td></td>
</tr>
<tr>
<td>OIL TANK CAPACITY</td>
<td>50 litres</td>
<td></td>
</tr>
<tr>
<td>QUICK COUPLERS</td>
<td>3/4” flush face</td>
<td></td>
</tr>
<tr>
<td>ENGINE</td>
<td>Briggs &amp; Stratton 23 Hp</td>
<td>Lombardini / Kohler 23 Hp</td>
</tr>
<tr>
<td>N° CYLINDERS</td>
<td>twin cylinders</td>
<td></td>
</tr>
<tr>
<td>STARTING</td>
<td>Battery - Recoil</td>
<td>Battery</td>
</tr>
<tr>
<td>ACCELERATION</td>
<td>Manual</td>
<td></td>
</tr>
<tr>
<td>FUEL TANK CAPACITY</td>
<td>30 L</td>
<td></td>
</tr>
</tbody>
</table>

- FLEXIBLE HYDRAULIC HOSES ARE NOT INCLUDED IN PRICE
- LENGTH AND DIAMETER OF HOSES DEPEND UPON THE FLOW AND USE AND MUST BE SPECIFIED AT THE ORDER
## DIESEL POWER PACKS

### SCORPION Diesel

**20 L/min @ 110 Bar - 12 L/min @ 180 Bar**

*Diesel Engine Yanmar 7 Hp*

<table>
<thead>
<tr>
<th>TECHNICAL CHARACTERISTICS</th>
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</tr>
</thead>
<tbody>
<tr>
<td>WEIGHT Kg</td>
<td>70</td>
</tr>
<tr>
<td>DIMENSION cm LxWxH</td>
<td>70 x 50 x 57</td>
</tr>
<tr>
<td>FLOW L/min</td>
<td>20 @ 100 Bar (12 @160 Bar)</td>
</tr>
<tr>
<td>PRESSURE Bar</td>
<td>100 or 160</td>
</tr>
<tr>
<td>ENGINE</td>
<td>Yanmar Diesel 10,5 Hp</td>
</tr>
<tr>
<td>STARTING</td>
<td>Manual</td>
</tr>
<tr>
<td>ACCELERATION</td>
<td>Manual</td>
</tr>
<tr>
<td>HOSES LENGTH std</td>
<td>7 mt</td>
</tr>
</tbody>
</table>

Hydraulic power pack with 7 Hp Diesel engine- recoil start, thanks to the compact dimension can be easily lifted and transported. The machine is available in two configurations of hydraulic power:

- 20 L/min @ 100 Bar adjustable
- 12 L/min @ 160 Bar, adjustable

These characteristics allow to power some tools of the class “C” of EHTMA standard or other type of hydraulic equipment. Many components are common to those of larger power packs such as the stainless steel frame, all the parts suspended on anti vibration shock mounts, the quick couplers installed on impact free swivel fitting, high efficiency oil cooling system that guarantees the best performances even in the hottest climate and with the more demanding applications. Agile and robust **SCORPION D** is ideal in general hydraulic applications and in all works where are needed the hydraulic characteristics of the machine.

### RAPTOR Diesel

**30 L/min @ 140 Bar - (20 L/min @ 200 Bar)**

*Diesel Engine Yanmar 10,5 Hp*

<table>
<thead>
<tr>
<th>TECHNICAL CHARACTERISTICS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>WEIGHT Kg</td>
<td>80</td>
</tr>
<tr>
<td>DIMENSION cm LxWxH</td>
<td>85 x 60 x 65</td>
</tr>
<tr>
<td>FLOW L/min</td>
<td>20 - 30</td>
</tr>
<tr>
<td>PRESSURE Bar</td>
<td>130 (200 @ 20 L/min)</td>
</tr>
<tr>
<td>ENGINE</td>
<td>Yanmar Diesel 10,5 Hp</td>
</tr>
<tr>
<td>STARTING</td>
<td>Battery - Recoil</td>
</tr>
<tr>
<td>ACCELERATION</td>
<td>Manual</td>
</tr>
<tr>
<td>HOSES LENGTH std</td>
<td>7 mt</td>
</tr>
</tbody>
</table>

Hydraulic power pack with 10,5 Hp Diesel engine with battery and recoil start, machine supplies a flow from 20 to 30 L/min @ 130 Bar and can power tools of the group C and D of the EHTMA standard. Like all the DOA power packs **RAPTOR D** has excellent characteristics of transportability, robustness, quietness, reliability and a superior construction quality thanks to the stainless steel frame, all parts suspended on anti vibration shock mounts, quick couplers installed on impact free swivel fitting, high efficiency oil cooling system that guarantees the best performances even in the hottest climate and with the more demanding applications. **RAPTOR D** is for function and construction the best machine in its type as it can give both the best advantages of hydraulics and electricity, for its characteristics it is ideal in the maintenance of underground pipes, in the civil protection and in all application where is necessary a professional hydraulic power supply.
LOTUS DIESEL POWER PACK FOR HEAVY DUTY APPLICATIONS

Flow max 120 L/min
Pressure max 250 Bar

AVAILABLE DIESEL MOTOR
32 Hp - 48 Hp - 62 Hp

Is a professional power pack with Diesel engine designed for heavy duty prolonged operations, the engine is in “silent pack” version in a noise absorbing capsule the assure quiet operations even in areas at noise respect. The machine is available in different configurations of hydraulic power output and engine power depending on the type of application, the configuration must be specified at the order.

Thanks to the controls features LOTUS is ideal in the majority of works, the typical use is with underwater tools, powering big hydraulic driven water pumps and drilling equipment, as auxiliary parallel circuit of other machines.

CHARACTERISTICS, ADVANTAGES AND REGULATION CONTROLS FEATURES
- Flow adjustable by the engine speed (or on request with extra flow control valve)
- Pressures regulation
- Hour meter, pressure gauge, fuel level gauge
- Lower tray to collect oil spill in case of accidental leaks of liquids (prescribed by low)
- Strong chassis in square tubes and metal sheets with guides for forklift
- Four upper lifting eyes
- High quality dry painting
- High power battery with marine type cut-off for long storage
- Large capacity oil tank, 90 litres

CHARACTERISTICS OF DIESEL ENGINE
Engine Type: Diesel cooled air/oil
Engine power available: 32 Hp Twin Cyl - 48 Hp Three Cyl, - 62 Hp four Cyl
Maximum Engine running speed: 2300 rpm

HYDRAULIC CONFIGURATIONS
A - One hydraulic circuit with one gear pump for a single use
B - Two hydraulic circuits with two gear pumps for two parallel uses or for one single use when joining the two flows
C - Piston pump (for pressures above 210 bar)
D - Oil radiator
E - No oil radiator

HYDRAULIC CHARACTERISTICS (depending on engine type, hydraulic circuit type and application)
Maximum flow in single circuit: 120 L/min
Maximum flow of the two separate circuits: 60 L/min every circuit
Maximum Pressure with standard gear pumps: 210 Bar
Maximum Pressure with piston pump: 350 Bar

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>WEIGHT Kg</th>
<th>800 - 900 (Depending on model)</th>
<th>DIMENSION cm LxWxH</th>
<th>160 x 90 x 130 h</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLOW L/min</td>
<td>30 - 120 L/min</td>
<td>OIL TANK CAPACITY</td>
<td>80 Litres</td>
</tr>
<tr>
<td>PRESSURE Bar</td>
<td>250</td>
<td>ENGINE</td>
<td>Diesel Silent pack 32 - 48 - 62 Hp</td>
</tr>
<tr>
<td>ACCELERATION</td>
<td>Manual</td>
<td>QUICK-SPLIT COUPLERS</td>
<td>3/4” flat surface</td>
</tr>
</tbody>
</table>
**SUPER RAPTOR E**

Hydraulic power pack with tri phase motor

30 - 42 L/min @ 210 Bar max

Electric motor tri phase 400 V - 50 Hz

d power 9 - 11 - 15 Kw

Professional power pack with tri phase electric motor designed to power hydraulic tools and various hydraulic equipment, the motor power can be supplied with power 9 - 11 - 15 KW and the hydraulic power output can be with flow up to 42 L/min and pressures up to 210 Bar according to customer specifications.

SUPER RAPTOR E is fabricated for heavy duty operations, the high efficiency oil cooling system with exclusive double radiator guarantees the best performances even in the hottest climate and with the more demanding applications. The electric control panel has all the needed defences to guarantee the operator safety and the machine integrity in all conditions.

Thanks to the compact dimension and to the three bendable handles the operations of loading and movements are easy and swift.

The motor power and the hydraulic output needed of flow and pressure have to be specified at the order.

### TECHNICAL CHARACTERISTICS

| WEIGHT Kg | 120 |
| DIMENSION cm LxWxH | 85 x 60 x 65 |
| FLOWS at 2900 rpm of electric motor |
| 26 L/min with pump 9 cc | 32 L/min with pump 11 cc | 40 L/min with pump 14 cc |
| PRESSURE Bar | 140 - 210 |
| TYPE MOTOR | Tri phase 400 V - 50 Hz |
| MOTOR POWERS | 9-11-15 KW |
| HOSES LENGTH std | 7 mt |

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**ENERGA**

Multi flow power pack with inverter

20 - 30 - 40 L/min @ 210 Bar max

Engine trifase 11 Kw - 400 V - 50 Hz con INVERTER

Hydraulic professional power pack with Tri phase electric motor 11 Kw equipped with INVERTER CONTROL that allows to vary the motor speed and consequently the output hydraulic flow at any time, this feature allows to have available and choose in real time the typical flows of the hydraulic tools 20 - 30 - 40 L/min or change the speed of the tools connected even when are under load and working.

The machine versatility is ideal for powering hydraulic motors and tools or cylinders or various hydraulic machinery that require different speed or RPM or blow per minute.

**ENERGA can be supplied also with INVERTER with progressive variation of motor speed, so not with the three fixed flow/speed like the standard aversion**

### TECHNICAL CHARACTERISTICS

| WEIGHT Kg | 120 |
| DIMENSION cm LxWxH | 85 x 60 x 65 |
| FLOW L/min | 20 - 30 - 40 |
| PRESSURE Bar | 140 - 210 |
| ENGINE TYPE | Tri fase 400 V - 50Hz |
| MOTOR POWER | 11 KW |
| HOSES LENGTH std | 7 mt |
Hydraulic group formed by a small power pack and a hydraulic motor with proportional control valve studied for the mechanical rotation of organs that are normally rotated manually with hands. The group is used for lifting and lowering the upper deck of trains that transport automobiles, use is ideal for avoiding prolonged and tiring manual operations, it is enough to insert the tool spindle in the organ to turn and acting control valve is possible to rotate rapidly and without fatigue the more hard and heavy devices. The tool control valve is proportional type and allow rotation in two senses with speed control. The strong rotation force do not has to be controlled by the operator but is contrasted by the adjustable arm that assure the operator safety. Powerful and practical the group eliminates fatigue and down time increasing the productivity.

**ADVANTAGES**

- Robust frame in stainless steel with balanced handle to ease the transportability
- The upper plastic tray allow to conveniently put down tool after use
- High quality power pack with oil cooler to allow prolonged operations in tropical climates
- Large diameter wheels ease movements on rough terrains and ballast
- Tool can be used at a distance of 30 metres from pack
- Hydraulic motor torque is adjustable

**POWER PACK CHARACTERISTICS**

- **WEIGHT with liquids** Kg 80
- **DIMENSION LxWxH** 130 x 50 x 90
- **ENGINE TYPE** Single cylinder 4 stroke
- **POWER** 9 Hp
- **STARTING** Recoil or Battery (on request)
- **FUEL** Unleaded petrol
- **HYDRAULIC POWER** 20 L/min @ 140 Bar

**HYDRAULIC MOTOR CHARACTERISTICS**

- **WEIGHT** Kg 12
- **TORQUE/SPEED max** 250 Nm / 120 rpm
- **ARM DIMENSION** 70 cm
- **HOSE LENGTH** 7 mt
TRIDENT is a hydraulic accessory for trucks and vans formed by three parts that allows to obtain at low cost and everywhere electric, pneumatic and hydraulic energies from the engine of the vehicles exploiting the hydraulic primary energy produced by the vehicles engines.

TRIDENT is a hydraulic group formed and divisible in three compact modules that can be easily installed on board the trucks transforming them from normal transportation vehicles into real working equipment powerful, quiet, versatile, economical and with minimal maintenance needs.

With TRIDENT will be possible to power all electric, pneumatic and hydraulic tools like drills, grinders, water pumps, breakers, disc saws, ventilators, tower lights, welding and pipe fusion welding machines, impact wrenches and the majority of the equipment normally used in the outdoor maintenance works.
What is TRIDENT?

TRIDENT “COMBI” is a hydraulic accessory formed by three modules that allow to obtain at low cost and everywhere. Electric, pneumatic and hydraulic energies exploiting the hydraulic primary energy produced by the vehicles engines.

TRIDENT “COMBI” is formed and divisible in three compact modules that can be easily installed on board transforming trucks from a transportation vehicles into a professional working equipment powerful, quiet, versatile, economical and with minimal maintenance needs.

Le applicazioni tipiche

TRIDENT è ideale in tutti i lavori ed attività di manutenzione esterna:
- manutenzione reti urbane gas ed acqua – lavori urbani
- officine mobili, carri attrezzi e mezzi manutentivi vari
- nella protezione civile e mezzi militari
- nel lavoro in aree remote o pronto intervento in genere
- per comuni , municipalità , comunità montane

How it’s work?

TRIDENT is formed by 3 modules:

1. THE HYDRAULIC MODULE
   Cod. K0173
   Gives the hydraulic energy to the other two components and is formed by: the oil tank, diverter oil ON/OFF valve, pressure relief valve, oil radiator with electric fan, oil filter, quick couplers and the electric control panel with selection switches for the three functions and emergency arrest button. This module can be installed as single part to obtain hydraulic energy only for hydraulic hand tools like breakers, water pumps, disc saws etc.
   Minimum hydraulic power needed 35 L/min @180 bar
   Hydraulic power given to hydraulic tools 30 – 38 L/min @150 bar

2. THE GENERATOR/WELDER MODULE
   Cod. K0178
   Optional part, power and characteristics available in more power configurations tri/single phase to be chosen. Available also only as generator 10 KVA without welder.
   Electric power: 10 KWA in tri-phase - 4,5 KWA in single phase
   Welding power: 250 Ampere
   Type of generator and welder: rotative electro mechanical

3. THE AIR COMPRESSOR MODULE
   Cod. K0180
   Optional part (different air flow and characteristics also on request)
   Air flow max: 1000 L/min air delivered
   Air pressure: 10 Bar

The use of the three functions ( one at the time !!) can be chosen by acting on the selection switches on control panel.
**How it work?**

On the truck gear box must be installed a power take off and a hydraulic gear pump (these are accessories produced by different companies or can be ordered at the truck manufacturers with the new vehicle - see fig. 1 at page 4)

Then must be installed in convenient position the primary hydraulic module that has to be hydraulically connected by two hoses (suction and pressure) to the hydraulic gear pump.

The operator, with hand brake engaged, set the engine speed at the recommended RPM, then activate the hydraulic pump by pressing a button, when pump is connected to engine oil pressure is given (in free circulation) to the primary hydraulic module, then oil goes to the other two modules and back again to the primary hydraulic module, in this state the engine makes no effort as nothing is working.

The group is ready to work, the operator can select one of the three uses by pushing the electric switch located on the primary module and use the tool, (one tool at the time), in this mode the truck engine goes a little under load and can be felt a small engine speed decrease but the engine speed control automatically keep the speed stable as needed.

The operator can now work with hydraulic or electric or pneumatic tools!!

**SEE VIDEO ON** www.doa.it

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**What are the advantages?**

- Obtain from a truck three energies at low cost and everywhere
- Possibility of having current tri/single phase up to 12 KVA
- Possibility of welding at 250 Amps
- Possibility of generating Air Compressed up to 1000 L/min
- Possibility of powering all hydraulic tools at their maximum power (example the truck can become a dewatering pump to move up water to 3000 L/min flow)
- Reduction of weight loaded and space saving, no other equipment transported, high available power
- Maximum quietness – ideal in urban and night works
- Increased productivity and total utilisation of the vehicles
- Economy of running, minimal maintenance, easy use and no problem of continuous
- No thefts of equipment and fuel, no tiring and potentially dangerous loading/downloading operations of equipment from vehicles
- No problem of evacuations of smokes from engines used inside
- No need to have on board other fuels that can be dangerous
- The group can be reinstalled on other vehicles
### NECESSARY PRIMARY HYDRAULIC POWER FROM VEHICLE

<table>
<thead>
<tr>
<th>FLOW</th>
<th>min - max</th>
<th>35 - 42 L/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRESSURE</td>
<td>min - max</td>
<td>180 - 210 L/min</td>
</tr>
</tbody>
</table>

### CHARACTERISTICS OF HYDRAULIC PARTS

<table>
<thead>
<tr>
<th>NAME</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>OIL TANK CAPACITY</td>
<td>38 L</td>
</tr>
<tr>
<td>OIL RADIATOR</td>
<td>Radiator with electric fan 12 V</td>
</tr>
<tr>
<td>OIL FILTER</td>
<td>Cartridge Spin ON type</td>
</tr>
<tr>
<td>ON/OFF VALVOLE</td>
<td>3 ways, open center with relief valve</td>
</tr>
<tr>
<td>SELECTION OF FUNCTIONS</td>
<td>By electric buttons on control panel</td>
</tr>
<tr>
<td>HYDRAULIC MOTORS TYPE</td>
<td>Gear type group 2 with activation by solenoid 12 V</td>
</tr>
</tbody>
</table>

### HYDRAULIC POWER TO HYDRAULIC TOOLS

| FLOW | All hydraulic power available from primary circuit and proportional to engine speed |
| PRESSURE | Regulated at 150 Bar |

### CHARACTERISTICS WELDER AND GENERATOR

<table>
<thead>
<tr>
<th>NAME</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>WELDER TYPE</td>
<td>Mod. FW2-DC with Volt meter and RCBO protection</td>
</tr>
<tr>
<td>WELDING POWER</td>
<td>Max 250 Amp regolable</td>
</tr>
<tr>
<td>GENERATOR POWER</td>
<td>10 KVA in tri phase - 4.5 KVA in single phase</td>
</tr>
<tr>
<td>WELDING POWER REGULATION</td>
<td>Yes by fine tuning knob</td>
</tr>
</tbody>
</table>

### COMPRESSOR CHARACTERISTICS

<table>
<thead>
<tr>
<th>NAME</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIR DELIVERED</td>
<td>Flow max 1000 L/min @ 7 Bar</td>
</tr>
<tr>
<td>AIR ASPIRED</td>
<td>1200 L/min</td>
</tr>
<tr>
<td>AIR PRESSURE</td>
<td>Max 10.5 Bar adjustable (on request up to 15 Bar)</td>
</tr>
<tr>
<td>AIR TANK CAPACITY</td>
<td>25 L (standard model) possibility to install larger size tanks</td>
</tr>
<tr>
<td>COMRESSOR TYPE</td>
<td>2 stages with cast iron head for heavy duty applications</td>
</tr>
<tr>
<td>CONTROLS</td>
<td>2 pressure gauges (1 for the tank, and 1 for the output pressure regulation)</td>
</tr>
</tbody>
</table>

### WEIGHT AND DIMENSION

<table>
<thead>
<tr>
<th>NAME</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIMENSION standard module</td>
<td>mm 716 x 445 x H 500 the three modules have same dimension</td>
</tr>
<tr>
<td>WEIGHT hydraulic module</td>
<td>Kg 82 with oil</td>
</tr>
<tr>
<td>WEIGHT electric module</td>
<td>Kg 102</td>
</tr>
<tr>
<td>WEIGHT pneumatic module</td>
<td>Kg 102</td>
</tr>
</tbody>
</table>

---

**DOA Srl** reserves the right to make modifications or change configuration, function and characteristics at any time without previous notice. The above datas are refered to performances derived from the ideal realization of the complete hydraulic circuit and connection to vehicle.

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**TYPICAL EXAMPLE OF INSTALLATION**

![Diagram of installation](image)
HYDROBOX is a compact hydraulic accessory installable on trucks and vans, can be installed on all vehicles equipped with hydraulic pump or that have the possibility to install it, HYDROBOX transforms these vehicles in powerful and economical power sources of hydraulic tools and various hydraulic equipment such as winches, hydraulic generators, cranes, compressors, etc.

HYDROBOX is in substance a complete professional hydraulic power pack, the engine produces the hydraulic power, HYDROBOX manages the power, with HYDROBOX vehicles avoid to transport, tow, load and download the typical heavy and bulky electric generator or compressors, the vehicles can power in autonomy a wide range of tools and equipment normally used in external urban works, in the utilities line maintenance and also in operations for rescue and civil protection.

HYDROBOX is an accessory designed for professional use that occupies minimal space on board, can be installed also under the open loading platform of trucks (like a normal tool box) it does not require approvals. For the installation is just necessary to connect the HYDROBOX to the gear pump by two hoses (suction and pressure) and the vehicles will be transformed from a simple transporter item into a practical and versatile hydraulic autonomous power source “on wheels”.

**ADVANTAGES**

- Safety and maximum quietness
- Power maximum running economy and practicality
- Versatility and total utilization of the vehicle
- Avoids to transport, tow, load/download heavy bulky power units of other type
- Easy to install and use
- Minimal space and weight occupied on board
- Always ready to use with minimal maintenance need
 TECHNICAL CHARACTERISTICS

PESO con olio 38 kg
DIMENSION 480 x 300 x H 450 mm

HYDRAULIC CHARACTERISTICS

TANK CAPACITY 15 L (possibility to have larger tanks capacity)
FLOW max 42 L/min (ADJUSTABLE)
PRESSURE max 210 Bar
RADIATOR 2 high efficiency radiators with centrifugal fan 12 Volt
ON/OFF VALVE 3 ways, open center with relief valve.
KD12 hydraulic breaker Kg12 with “D type” anti vibration handle, tool is “operator friendly” and its use is ideal in general demolition works either in vertical and horizontal position against walls. KD12 gives the best compromise between high power and manoeuvrability, can be powered by power packs or by the hydraulic circuit of mini excavators, trucks or other machines with sufficient hydraulic circuit. The hydraulic functioning assures quietness, productivity, fuel economy united with the excellent transportability of the group power pack/breaker eliminating the typical problems of transport and movements of the bulky air compressors and pneumatic breakers.

**ADVANTAGES**
- Anti vibration handle according to the newest CE regulations allows operators comfort and safety
- Tool can work at flow 20 or 30 L/min (to be specified at the order)
- Tools has only one dynamic seal and few moving parts to assure maximum reliability and a unbeatable operative longevity
- High tolerance to back pressure allows to use tool with very long oil hoses
- Available in underwater version for marine demolition works
- Adjustable side handle
- Slim tool profile without side rods or sharp angles assures maximum ergonomics
- Are available special percussion heads configured to dig in electric earthing pickets or small poles

**AVAILABLE IN UNDERWATER VERSION**

**TECHNICAL CHARACTERISTICS**

| WEIGHT Kg | 12 |
| DIMENSION cm LxH | 18 x 56 |
| TOOL BIT SIZE | 22 x 82 |
| FLOW L/min | 18 - 30 |
| PRESSURE Bar | 150 |
| BLOW FREQUENCY | 1300 - 1500 |
| IMPACT ENERGY | 5,5 KGM |
| HANDLE TYPE | “D” anti vibration |

KV16 hydraulic breaker Kg16 with “T type” anti vibration handles suspended on springs, tool is “operator friendly” and its use ideal in general demolition works of concrete and asphalt cutting. KV16 gives the best compromise between high power and manoeuvrability, can be powered by power packs or by the hydraulic circuit of mini excavators, trucks or other machines with sufficient hydraulic circuit. The hydraulic functioning assures quietness, productivity, fuel economy united with the excellent transportability of the group power pack/breaker eliminating the typical problems of transport and movements of the bulky air compressors and pneumatic breakers.

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- Slim tool profile without side rods or sharp angles assures maximum ergonomics
- Are available special percussion heads configured to dig in electric earthing pickets or small poles

**AVAILABLE IN UNDERWATER VERSION**

**TECHNICAL CHARACTERISTICS**

| WEIGHT Kg | 16 |
| DIMENSION cm LxH | 42 x 67 |
| TOOL BIT SIZE | 22 x 82 |
| FLOW L/min | 18 - 30 |
| PRESSURE Bar | 150 |
| BLOW FREQUENCY | 1300 - 1500 |
| IMPACT ENERGY | 5,5 KGM |
| HANDLE TYPE | “T” anti vibration |
KV19 Breaker Kg 19

KV19 hydraulic breaker Kg19 with “T type” anti vibration handles suspended on springs, tool is “operator friendly” and its use ideal in general demolition works of concrete and asphalt cutting. KV19 gives the best compromise between high power and manoeuvrability, can be powered by power packs or by the hydraulic circuit of mini excavators, trucks or other machines with sufficient hydraulic circuit. The hydraulic functioning assures quietness, productivity, fuel economy united with the excellent transportability of the group power pack/breaker eliminating the typical problems of transport and movements of the bulky air compressors and pneumatic breakers.

ADVANTAGES
- Anti vibration handles according to the CE standards allow operators comfort and safety
- Tool can work at flow 20 or 30 L/min (to be specified at the order)
- Tools has only one dynamic seal and few moving parts to assure maximum reliability and a unbeatable operative longevity
- High tolerance to back pressure allows to use tool with very long oil hoses
- Are available special percussion heads configured to dig in electric earthing pickets or small poles
- Slim tool profile without side rods or sharp angles assures maximum ergonomics

TECHNICAL CHARACTERISTICS
- WEIGHT Kg 19
- DIMENSION cm LxH 42 x 72
- TOOL BIT SIZE 25 x 108
- FLOW L/min 18 - 30
- PRESSURE Bar 150
- BLOW FREQUENCY 1300 - 1500
- IMPACT ENERGY 7 KGM
- HANDLE TYPE “T” anti vibration

HD13 Hammer drill Kg 13

Hydraulic hammer drill Kg 13 for concrete and masonry with standard bit attachment SDS MAX. Light, compact and power full is ideal in all drilling works where are needed performances, manoeuvrability and safety. The hydraulic functioning is implicitly quite and safe and allow to use tool even completely submerged in water or with the operator inside a trench with “feet in water and mud”, condition rather common but very dangerous and prohibited by low if are used electric tools. HD13 is very robust and it is constantly lubricated by the oil that power it, this gives a long operative life and an unmatched reliability. For these characteristics it is often irreplaceable in maintenance of gas and water utilities lines and in the under water works.

ADVANTAGES
- Anti vibration handle according to the newest CE regulations allow operators comfort and safety
- Tool can work at flow 20 or 30 L/min (to be specified at the order)
- Few moving parts constantly lubricated by oil assure reliability and a unbeatable operative longevity
- High tolerance to back pressure allows to use tool with very long oil hoses
- Adjustable side handle
- The Standard bit attachment SDS MSX allows a wide availability of accessories that can be bought everywhere

TECHNICAL CHARACTERISTICS
- WEIGHT Kg 13
- DIMENSION cm LxH 18 x 50
- TOOL BIT SIZE SDS Max
- FLOW L/min 20 - 30
- IDEAL FLOW L/min 20
- PRESSURE Bar 140
- DRILL CAPACITY ⌀ mm 5 - 50
- IDEAL DRILL CAPACITY ⌀ mm 10 - 32
- DISTANCE BETWEEN HOLE CENTRE AND WALL mm 55
DC 16

HYDRAULIC DISC SAW
disc capacity ø 400 mm

Available in 3 hydraulic flow configurations  20 L/min - 30 L/min - 38 L/min

Possible to be used as cutter asphalt saw if installed on the SC40 cart.

ADVANTAGES
- Exclusive high performance DOA hydraulic motor that holds disc speed even with high cutting load
- Direct transmission of the disc without vulnerable belts
- Saw is installable on the saw cart SC40 to become in few seconds a practical asphalt cutter
- Water is given to disc from center and without vulnerable external water hoses to give ideal cooling
- Lever to arrest water supply to disc

VARIANTS AND MODELS
DC16 is available in three sub models with different characteristics of hydraulic flow, so with different motor size and performance.

DC14 ideal flow 20 L/min, can power discs with max diameter 350 mm (14”)
DC16 ideal flow 30 L/min, can power discs with diameter 400 mm (16”) and 350 mm (16”)
DC18 ideal flow 38 L/min, can power discs with diameter 400 mm (16”) and 350 mm (16”)

TECHNICAL CHARACTERISTICS

WEIGHT Kg 8,5
DIMENSION cm LxH 70 x 40
FLOW L/min 20 DC14 - 30 DC16 - 38 DC18
PRESSURE Bar 140 - 180
DISC DIAMETER cm 35 - 40 (14” - 16”)
SHAFT DIMENSION cm 2,54 - 1”
CUTTING CAPACITY cm 14,5 with disc ø 40 cm
SPEED RPM max 4300 RPM
ROTATION CW clockwise

Hydraulic disc saw with disc capacity up to 400mm (16”). The tool can install “black” discs for metal and diamond discs for concrete and masonry, ergonomic and light DC16 has a unbeatable power to weight ratio, the hydraulic functioning guarantees the maximum safety as no electricity means no possibility of electric shock hazard, absence of emissions, minimal noise vibrations and maintenance, reliability, long operative life, possibility to work in any position or conditions, can also be used for professional underwater works.
SC40 is an accessory of disc saw DC16 that transforms the tool in a real practical ASPHALT CUTTER, the saw can be installed on the cart in few seconds without need of tools or making complicated regulations and annoying cable adjustments. operations that are needed instead on all other similar accessories, the hydraulic connection is simply made connecting the oil couplers to the ON/OFF valve of the cart, so in few instants a real asphalt cutter is ready for use, the water tank is easily detachable for refilling of cleaning, the adjustable and bendable handle allows ergonomics and easy storage. Incredibly powerful thanks to the high performances of DC16 the cart is probably the best products in its type.

ADVANTAGES
- Equipped with independent hydraulic ON/OFF trigger valve that avoids complicated regulations
- Easy installation of the saw on cart, no need of spanners, connection cable and adjustments
- High quality removable water tank with large filling mouth
- Folding handle simplifies the use and storage
- Robust construction and no necessity of maintenance
- Aluminum wheels with bearings, disc penetration with screw and handle, calibre to visualize the penetration depth

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>WEIGHT without saw Kg</td>
<td>52</td>
</tr>
<tr>
<td>WEIGHT with saw Kg</td>
<td>62</td>
</tr>
<tr>
<td>DIMENSION cm LxH</td>
<td>70 x 40</td>
</tr>
<tr>
<td>TANK CAPACITY</td>
<td>30 Litres</td>
</tr>
<tr>
<td>CUTTING CAPACITY cm</td>
<td>14,5 with diameter disc 400 mm</td>
</tr>
<tr>
<td>ROTATION</td>
<td>Clockwise</td>
</tr>
<tr>
<td>HANDLE</td>
<td>Adjustable at 180°</td>
</tr>
</tbody>
</table>
AS 23 HYDRAULIC GRINDER
diameter disc 230 mm (9”)

HYDRAULIC GRINDER - DISC SAW
AS 23 is a compact angular grinder/cut of saw, the hydraulic functioning assures power, quietness, long operative life and maximum safety thanks to the implicit impossibility of causing electric shocks. For these characteristics AS 23 is irreplaceable in external works with presence of water, in the maintenance of utilities networks, in metal brushing for preparation of welding, in works inside the excavation and in the UNDERWATER WORKS. Mounts standard discs with diameter 230mm (9”) or metal brushes for scrubbing or cleaning ship hulls and propellers from marine formations. With cutting disc AS 23 becomes a precise cut off saw which manoeuvrability allows complete rotation around large pipes easing the cut in narrow spaces. For characteristics and function AS 23 is irreplaceable in many applications where electric tools cannot be used for safety reasons.

ADVANTAGES
- Exclusive hydraulic “orbital” motor fabricated by DOA with high speed and high torque, motor does not reduce speed even with high load on disc
- Available with hydraulic motor for 20 or 30 L/min oil flow (to be specified at the order)
- Few moving parts always bathed in oil assure constant lubrication and long operative life
- High tolerance to back pressure allows to use long oil hoses
- Two positions side handle

AVAILABLE IN UNDERWATER VERSION

TECHNICAL CHARACTERISTICS

| LENGTH cm | 25 |
| WIDTH cm | 32 |
| WEIGHT Kg | 5 |
| PRESSURE Bar | 140 - 200 |
| FLOW L/min | 20 - 34 |
| DIAMETER DISC | ø mm 230 - Foro mm 22-23 |
| SPEED LOAD Mod. terrestrre | 5500 @ 30 L/min |
| SPEED LOAD Mod. underwater | 2200 @ 30 L/min |
RP140 is a percussion rod designed to make holes with depth up to 140 cm - diameter 14 mm in soft and moderately stony terrains or under the asphalt surface of roads. The holes are necessary in the location of underground gas leaks, an electronic “sniffing probe” is then inserted into holes to check the gas presence in the ground. The use is easy and the result is the best, the operator simply points the tool and then “hammers down” the rod with the upper sliding piston, this percussion will push the rod till the needed depth, for extraction the piston must be hammered up word. Another advantage of these tools is that the operator can feel when an object has been reached and arrest the action to avoid damages on pipes or other underground service or duct.

The tool have unique construction and functional characteristics:

- **CERTIFIED ELECTRIC INSULATION** the upper sliding piston is coated with special moulded plastic grip that assures 15.000 Volt electric insulation to protect operators from accidental contacts with underground cables.
- **MODULAR CONSTRUCTION** tools can be reassembled, is then possible to replace those parts that may be worn or deformed, this means versatility, durability and economy.
- **ROD BITS IN SPARK FREE METAL REPLACEABLE** it is possible to install on the rods interchangeable points made in spark free material that can be substituted when warn or deformed.
- **EXCLUSIVE ROD WITH HEXAGONAL SECTION** in soft loose terrains it is possible to twist the rod, the effect of this rotation with the compressive action of the rod edges compact the hole walls and allow retraction of the rod without earth crumbling, this leaves clean holes till the bottom for a faster gas priming and an easier insertion of the detector probe.
AS40 is an asphalt saw with cutting capacity up to 17cm (with Ø 500mm disc). Thanks to the modern and unique solutions it is ideal in all professional cutting works of asphalt and concrete, all components of the AS 40 are of the highest quality, for its operation and durability the machine is one of the best products available today on the market:

- The water supply from the centre of the shaft means ideal disc cooling, the water reaches the diamond segments radially and goes exactly where it is needed assuring economy of water, reduction of the down time for refilling and total dust suppression
- The disc penetration is made by an arm hinged directly on the engine, this keeps the engine position level assuring ideal engine lubrication in all inclinations, the penetration arm is fabricated from a solid aluminium stock
- The penetration arm reduces a lot the effort when turning the penetration handle, as it has to lift only the arm and not all the machine weight as needed on the traditional asphalt saws
- The very low centre of gravity means stability and ideal distribution of weight.
- The disc transmission belt is “poly V” type for heavy duty applications, this exclusive strong belt does not require tensioning, it assures quietness and a long lasting service without problems
- The weight distribution and total weight of 120 Kg (150 Kg with water) assure stability, manoeuvrability and maximum performances
- The handle is suspended on rubber shock mounts to reduce vibration levels, the angle of the handle can be positioned where needed and can be completely folded to reduce space during transport
- The engine and the parts are well protected against the impact and various blows received during use and transport
- The wheel has a brake to hold the machine when transported
- The disc guard is very durable in order to resist impacts and deformation, it can be opened only with spanners as it is prescribed by the recent CE norms, (the system with rapid latch opening of the disc cover are not at norm today)
- The water tank of 30 litres capacity can be removed in a second without the need of tools, it is in indestructible high quality plastic, has a large opening for easy refilling, cleaning and transportation. The machine has also a water attachment for the connection to the city water network
- The control panel has the stop button for emergency arrest of engine, the acceleration lever is well protected from impacts

### TECHNICAL CHARACTERISTICS

| WEIGHT Kg | 120 |
| WEIGHT with liquids Kg | 150 |
| DIMENSION cm LxWxH | 110 x 55 x H 95 |
| WATER TANK capacity L | 30 |
| DISC DIAMETER Max | 500 mm (20”’) |
| CUTTING DEPTH | cm 9,5 disc 350 mm - cm 12 disc 400 mm - cm 14,5 disc 450 mm - cm 17 disc 500 mm |
| IDEAL DISC DIAMETER | 400 mm (16”’) |
| DISC HOLE | 25,4 mm (1”’) |
| ENGINE | Robin Subaru EH 41 or HONDA GX 390 |
| ENGINE POWER | 13,5 Hp Honda - 14 Hp Subaru |
| FUEL | BENZINA |
Water passage from the center of the shaft and disc assures ideal cooling of diamond segments and maximizes the water use.

The vulnerable parts of machines are protected by strong square tubes against impacts and abuses.

Adjustable folding handle assures maneuverability and reduce space when transported.

Exclusive disc penetration with the arm hinged on engine, allows keep the engine always in plane position to guarantee ideal lubrication in any condition.

**AS40 ASPHALT SAW**

**ADVANTAGES**

- Discs diameters mm
- Cutting Capacity cm
- Adjustable folding handle assures maneuverability and reduce space when transported
- Exclusive disc penetration with the arm hinged on engine, allows keep the engine always in plane position to guarantee ideal lubrication in any condition

<table>
<thead>
<tr>
<th>Discs diameters mm</th>
<th>Cutting Capacity cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>350</td>
<td>9.5</td>
</tr>
<tr>
<td>400</td>
<td>12</td>
</tr>
<tr>
<td>450</td>
<td>14.5</td>
</tr>
<tr>
<td>500</td>
<td>17</td>
</tr>
</tbody>
</table>
AK46 S
Hydraulic pistol core drill for holes Ø 30 - 100 mm

AK46 G
Hydraulic pistol core drill for holes Ø 80 - 160 mm

AK46 is a hydraulic core drill designed for manual use or for use with drill rigs.
Tool is available in two configurations
- AK46 S for holes from Ø 30 a 100 mm
- AK46 G for holes from Ø 80 a 160 mm

The hydraulic functioning and the superior technical characteristics assure a series of advantages not obtainable from traditional electric core drill tools:
- Impossibility to cause electric shocks, can work even in complete water immersion
- Absence of vibration and noise
- Unbeatable ratio weight / power / dimension
- Long operative life and minimal maintenance needs
- Hydraulic motor cannot be damaged even in case of prolonged block of rotation or overload
(condition that will damage electric tools)

AK46 is in many conditions the unique alternative to traditional electric tools, it is ideal in the maintenance of gas, water, sewers networks, irreplaceable when is needed to creates a pipe passage through walls of historical buildings that cannot undergo to vibrations or in the use inside trenches with high water presence

Advantages
- Safety valve that automatically cuts rotation in case of block of the core beat, the valve avoids accidents deriving from tool recoil kicks and assuring a safe use when used manually
- ON / OFF trigger with “lock on” button for use of the tool on drill rigs
- Equipped with level gauge to show vertical / horizontal linearity of holes
- Construction in Ergal and stainless steel to guarantee lightness and durability
- Exclusive adjustable back handle allows feed pressure on the tool pushing with chest or knee
- Long side handle to allow secure rotation contrast

Technical Characteristics

<table>
<thead>
<tr>
<th></th>
<th>AK46 S</th>
<th>AK46 G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cut Capacity Ø mm</td>
<td>30 - 100</td>
<td>80 - 160</td>
</tr>
<tr>
<td>N° Speed @ 20 L/min</td>
<td>1000 @ 20 L/min</td>
<td>400 @ 20 L/min</td>
</tr>
<tr>
<td>N° Speed @ 30 L/min</td>
<td>1500 @ 30 L/min</td>
<td>600 @ 30 L/min</td>
</tr>
<tr>
<td>Weight Kg</td>
<td>8 without handle</td>
<td></td>
</tr>
<tr>
<td>Dimension LxPxH cm</td>
<td>40 x 9 x H 32</td>
<td></td>
</tr>
<tr>
<td>Distance bit centre to wall angle cm</td>
<td>4,5</td>
<td></td>
</tr>
<tr>
<td>Attachment of core bit</td>
<td>1-1/4” Standard (internal 1/2” BSP)</td>
<td></td>
</tr>
<tr>
<td>Flow L/min</td>
<td>20 - 30</td>
<td></td>
</tr>
<tr>
<td>Pressure Bar</td>
<td>140 - 180</td>
<td></td>
</tr>
</tbody>
</table>

DG15 - Drilling guide
Accessory of AK 46 that allows to make manually, rapidly and safely large holes in sewers pipes in concrete or fiber glass, the shape is similar to a “saddle” that is placed on the curve of the pipes in any position, avoids to use and fix the normal drill rigs, the operator will simply push on the tool compressing the spring return pistons for working in complete safety. DG 15 is a time and complication savior tool, can be used also as accessory of common electric core drills.
AK50 is a hydraulic core drill tool designed for heavy duty drilling works for holes with diameters up to 70 cm, the tool is very robust and made with the best components and materials to assure an use simple reliable while giving the best performances.

In order to give a wide range of speeds and drilling capacity on the tool can be installed six different hydraulic motor groups that include the ON / OFF valve, the quick couplers and the quick coupling motor / shaft. The motors are orbital type this means zero maintenance and a long lasting use without problems, only the 20cc motor is gear type. The motor groups can be changed in few seconds just loosing two screws and are equipped with a pressure relief valve that protects when tool is connected to the circuit of a machine with an excess of pressure.

AK50 does not require maintenance and will assure long lasting service without problems. AVAILABLE IN UNDERWATER VERSION.

**TECHNICAL CHARACTERISTICS**

<table>
<thead>
<tr>
<th>CHARACTERISTIC</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>WEIGHT Kg</td>
<td>13</td>
</tr>
<tr>
<td>DIMENSION L x H</td>
<td>54 x 22</td>
</tr>
<tr>
<td>ATTACHMENT OF CORE BIT</td>
<td>1-1/4” (interno 1/2” BSP)</td>
</tr>
<tr>
<td>FLOW L/min</td>
<td>30 - 38</td>
</tr>
<tr>
<td>PRESSURE Bar</td>
<td>120 - 200</td>
</tr>
<tr>
<td>MOTOR</td>
<td>12 Hp (@ 38 L/min - 140 Bar)</td>
</tr>
<tr>
<td>SPEED min - max</td>
<td>90 - 1750 giri/min</td>
</tr>
<tr>
<td>DIAM. HOLE min - max</td>
<td>30 - 700 mm</td>
</tr>
</tbody>
</table>

*The complete tool*

*The group motor - ON/OFF valve available in six size configurations of speed and hole diameter*
VENTILATORS - ASPIRATORS
HYDRAULIC ELECTRIC GASOLINE MOTORS

VENTILATORS/ASPIRATORS POWERFUL, EFFECTIVE AND EASY TRANSPORTABLE

A complete range of ventilators/aspirators powerful, effective and easy transportable, their use of ventilation and safety in closed space is mandatory and prescribed by law before, during and after works in environment that can be dangerous, toxic, flammable or explosive like tunnels, basements, manholes, silos, holds, tanks, petrochemical plants, wells, fuel stations, warehouses, mines, laboratories, confined space excavations, sewers ducts, gas distribution networks etc. The anti explosion proof model AV28 ATEX is irreplaceable when is needed to operate in presence of gas and vapours explosive or flammable.

Extremely light can be used in different positions or used with or without the flexible air hose. The air hoses are necessary to direct, transport and suction of the air IN or FROM a precise point, without the hoses can be used just like positive ventilators to supply a powerful direct “wall of air”.

The exclusive DOA system to fix the hoses on tools allows a quick installation on the mouth by simply “button up” the hose edge on pins only by hands without needing screw drivers or belts/clamp.

The volute and air fan can be washed up without problems as are in polyethylene, maintenance necessity is minimal.

Very robust thanks to the construction in polyethylene and stainless steel are invulnerable to impacts rust water and from the corrosion of the majority of acids and chemical agents.

SAFETY NOTES

- For maximum safety, never use tool in aspiration if it is not known the nature of the fumes or if cannot exclude that the fumes to be sucked could be flammable or explosive, in such a case or in doubt tool must only be used as POSITIVE ventilator blowing into the ambient ventilating and making a sort of “air wash” of the ambient.
- To suck and consequently centrifuge / pressurize explosive gas make them even more explosive in case of priming with a spark.
- Can be sucked only fumes toxic or poisonous (but not explosive) like engine fumes, welding fumes, CO2, dusts etc…
- It occurred many times that in the attempt to help a victim stunned from gas also the rescuers remain victim from the gas as it was not realized the motive of the accident and the toxicity of the ambient.
- Some gas and even the lack of oxygen are odorless so can be fatal without giving suspects or signs of danger.
**TECHNICAL CHARACTERISTICS**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WEIGHT Kg</strong></td>
<td>21</td>
<td>21</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td><strong>DIMENSION L x P x H</strong></td>
<td>60 x 57 x 74</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>HYDRAULIC FLOW L/min</strong></td>
<td>20 - 40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PRESSURE Bar</strong></td>
<td>100 - 210</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>POWER ELECTRIC MOTOR</strong></td>
<td>●</td>
<td>●</td>
<td>230 V - 1,5 KW</td>
<td>230 V - 1,5 KW</td>
</tr>
<tr>
<td><strong>POWER GASOLINE ENGINE</strong></td>
<td>●</td>
<td>3 Hp - Honda</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td><strong>MATERIAL OF VOLUTE AND FAN</strong></td>
<td>POLYETILENE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MOUTHS DIAMETER</strong></td>
<td>200 mm (8”)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AIR FLOW</strong></td>
<td>2100 m x h @ 2900 RPM of fan</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Practical centrifugal ventilator / aspirator with hydraulic motor. Powerful and easy transportable its use is mandatory by law for putting in safety conditions an ambient before and during operations in closed environment that could be dangerous or explosive like tunnels, basements, manholes, silos, large tanks, holds, wells, petrochemical plants, gas stations, mines, laboratories, narrow trenches, sewers ducts, gas distribution networks, etc...

Extremely light can be inclined and used in more positions, can be used with or without the flexible hose, flexible hoses are needed when the air has to be transported IN or FROM a precise point, without hoses can be used as positive ventilator blower to make a powerful and direct “air wall”. The volute and impeller are in robust polyethylene and polypropylene materials invulnerable to water, rust and corrosion, the frame is in indestructible stainless steel.

**AV28 H**

**HYDRAULIC VENTILATOR / ASPIRATOR**

**ADVANTAGES:**
- High power thanks to the possibility given by hydraulic motors to give a high speed to the fan
- Hydraulic motor has no exhaust so can be placed directly in closed ambient
- Absence of electricity makes it implicitly safe, insensible to rain and high water presence
- Quiet, no vibration, minimal maintenance need
- Can be used in more positions or in the normal upward position or inclined on side or back to direct or suck air flow directly from manholes, sewers covers, hatches
- The volute and the air fan can be washed without problems
- Can be powered from hydraulic power packs or from the hydraulic circuit of trucks, mini excavators, etc…
- Hydraulic motor is equipped with safety valve to protect against excess of flow of hydraulic flow / fan speed
- The exclusive DOA system allows to install the air hoses on the mouths in few seconds without needing screw drivers, clamps or other fixing devices
- Long folding handle to ease transportation, equipped with lifting eye

**AV28 S**

**VENTILATOR / ASPIRATOR WITH GASOLINE ENGINE**

Practical centrifugal ventilator / aspirator with gasoline engine. Powerful and easy transportable its use is mandatory by law for putting in safety conditions an ambient before and during operations in closed environment that could be dangerous or explosive like tunnels, basements, manholes, silos, large tanks, holds, wells, petrochemical plants, gas stations, mines, laboratories, narrow trenches, sewers ducts, gas distribution networks, etc…

Extremely light can be used with or without the flexible hose, flexible hoses are needed when the air has to be transported IN or FROM a precise point, without hoses can be used as positive ventilator blower to make a powerful and direct “air wall”. The volute and impeller are in robust polyethylene and polypropylene materials invulnerable to water, rust and corrosion, the frame is in indestructible stainless steel.

**ADVANTAGES:**
- High power, can be used everywhere in autonomy
- Absence of electricity makes it implicitly safe, insensible to rain and high water presence
- The volute and the air fan can be washed without problems
- The exclusive DOA system allows to install the air hoses on the mouths in few seconds without needing screw drivers, clamps or other fixing devices
- Long folding handle to ease transportation, equipped with lifting eye
AV28 E

ELECTRIC VENTILATOR / ASPIRATOR – 230 V

Practical centrifugal ventilator / aspirator with 230 V electric motor. Powerful and easy transportable its use is mandatory by law for putting in safety conditions an ambient before and during operations in closed environment that could be dangerous or explosive like tunnels, basements, manholes, silos, large tanks, holds, wells, petrochemical plants, gas stations, mines, laboratories, narrow trenches, sewers ducts, gas distribution networks, etc...

Extremely light can be inclined and used in more positions, can be used with or without the flexible hose, flexible hoses are needed when the air has to be transported IN or FROM a precise point, without hoses can be used as positive ventilator blower to make a powerful and direct “air wall”.

The volute and impeller are in robust polyethylene and polypropylene materials invulnerable to water, rust and corrosion, the frame is in indestructible stainless steel.

ADVANTAGES:

- Can be power by common home electric sockets or from small generators
- Electric motor has no exhaust so can be placed directly in closed ambient
- Quiet, no vibration, minimal maintenance need
- Can be used in more positions or in the normal upward position or inclined on side or back to direct or suck air flow directly from manholes, sewers covers, hatches
- The exclusive DOA system allows to install the air hoses on the mouths in few seconds without needing screw drivers, clamps or other fixing devices
- Long folding handle to ease transportation, equipped with lifting eye

AV28 ATEX

EXPLOSIONPROOF VENTILATOR / ASPIRATOR

Practical centrifugal ventilator / aspirator with 230 V electric motor ATEX certified:
Cat. II – 2G – IIC – c – T4

Powerful and easy transportable its use is mandatory by law for putting in safety conditions an ambient external or internal before and during operations in closed environment that could be dangerous or explosive like tunnels, basements, manholes, silos, large tanks, holds, wells, petrochemical plants, gas stations, mines, laboratories, narrow trenches, sewers ducts, gas distribution networks, etc...

Extremely light can be inclined and used in more positions, can be used with or without the flexible hose, flexible hoses are needed when the air has to be transported in or from a precise point, without hoses can be used as positive ventilator blower to make a powerful and direct “air wall”. The flexible air hoses must be only ANTISTATIC type that guarantee an absolute absence of spark. The volute and impeller are in robust polyethylene and polypropylene materials invulnerable to water, rust and corrosion, the frame is in indestructible stainless steel. Can be power only by a ATEX certify electric socket

ADVANTAGES:

- Electric motor has no exhaust so can be placed directly in closed ambient
- Quiet, no vibration, minimal maintenance need
- Can be used in more positions or in the normal upward position or inclined on side or back to direct or suck air flow directly from manholes, sewers covers, hatches
- The exclusive DOA system allows to install the air hoses on the mouths in few seconds without needing screw drivers, clamps or other fixing devices
- Long folding handle to ease transportation, equipped with lifting eye
HYDRAULIC WATER PUMPS

7 MOTIVES TO PREFER THEM

FOR THE POWER AND PERFORMANCES
The hydraulic pumps have an unbeatable power / weight / dimension ratio, example an hydraulic motor with power of 15 KW have a weight of only 4 Kg and the dimension of a beer can, which other type of motor either electric, gasoline, pneumatic or other can give such concentrated power? This gives to the hydraulic pumps compactness, lightness, easy handling and unmatched performances.

FOR THE SAFETY
Absence of electricity is an implicit assurance of safety as it is impossible to cause electric shocks, a man can work in all safety with the feet in the same water where the hydraulic pump is submerged and pumping, this will not be allowed by law and can be fatal when working with electric pumps, contacts or accidental rupture of the electric power cable can cause accidents and death.

FOR THE POSSIBILITY TO RUN DRY AND FOR MANY OPERATIONAL ADVANTAGES
A hydraulic pump can run dry without limitation and as long as needed, most the pumps either electric or with engine cannot run dry!!! The submersible pumps have not problem of priming, they pump as they touch the water, so it is possible to place the pumps is difficult access points where the traditional self priming pumps with engines cannot stay and operate or will simply sink in the mud.

FOR THE ROBUSTNESS AND FOR THE LONG OPERATIVE LIFE
For sure there are no other pumps that can stand impacts and abuses as the hydraulic pumps can!!
Pumps are really strong and are made to resist to the more heavy duty use.
The hydraulic functioning is assurance of “self lubrication”, so the motor is constantly lubricated by the oil.
In case of an accidental block of the impellers rotation, due to the entrance in the pumping chamber a solid object or a clog, nothing will happen to the hydraulic water pump, other pump will have serious damages in such conditions.

FOR THE VERSATILITY
The hydraulic pumps are really versatile as they can work powered by power packs and by the hydraulic circuits of excavators, back hoe loaders, trucks, mining machinery, tractors, boats and all working machinery equipped with a sufficient hydraulic circuit.

FOR THE EASY MAINTENANCE
The maintenance needed is minimal and simple, pumps are made with many parts that can be sourced on the market at low price. The simplicity of the hydraulic motors and associated components, the absence of the many complicate parts that are on the electric or self priming pumps make the maintenance easy and possible for any mechanic and without the need special tools or equipment.

FOR THE ECONOMY
For all the above advantages, for the economy of purchase, the economy of running, the economy on maintenance costs, the long operative life etc all this guarantee consistent cuts of costs and the maximum economy.
**SP20**

Trash water pump 2”

**SP21**

Water pump 2” ATEX

**SP20** is a compact and powerful trash pump with flow capacity up to 800 L/min and water heads up to 35 m, the tool that can pump solid objects with dimension up to 3 cm. The pump body is in hard stainless steel and the impeller is in chromium cast iron, materials that assure high resistance to impacts and abrasivity. Compact, reliable and safe the **SP20** is ideal used in the maintenance of utilities networks and in the urban maintenance in general.

**WP25**

Water pump 3”

**WP25** is a professional water pump with hydraulic motor designed for pumping clear and muddy water with suspended solids with dimensions up to mm 20. The performances are very high: flow up to 1.600 L/min with water head up to 45 meters. Thanks to its characteristics **WP 25** is ideal in the professional use, in the maintenance of utility networks, in large dewatering interferents, in the civil protection, in road maintenance works. Extremely robust and reliable can be powered from small hydraulic power packs or from the hydraulic circuits of earth moving machines, trucks, tractors etc.

---

<table>
<thead>
<tr>
<th>Specification</th>
<th>SP20 Details</th>
<th>WP25 Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OUTLET MOUTH</strong></td>
<td>2” BSP Female</td>
<td>3” BSP Female</td>
</tr>
<tr>
<td><strong>DIMENSION cm LxH</strong></td>
<td>22 cm x H 30 cm</td>
<td>30 cm x H 30 cm</td>
</tr>
<tr>
<td><strong>WEIGHT Kg</strong></td>
<td>8</td>
<td>9,5</td>
</tr>
<tr>
<td><strong>FLOW L/min</strong></td>
<td>800 L/min</td>
<td>1600 L/min</td>
</tr>
<tr>
<td><strong>WATER HEAD max</strong></td>
<td>35 m</td>
<td>45 m</td>
</tr>
<tr>
<td><strong>SP20 PUMPABLE SOLIDS DIM.</strong></td>
<td>3 cm</td>
<td>2 cm</td>
</tr>
<tr>
<td><strong>SP21 PUMPABLE SOLIDS DIM.</strong></td>
<td>1 cm</td>
<td></td>
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<tr>
<td><strong>IMPELLER MATERIAL</strong></td>
<td>Chromium cast iron</td>
<td>Hard aluminium alloy</td>
</tr>
<tr>
<td><strong>VOLUTE MATERIAL</strong></td>
<td>Stainless steel - INOX</td>
<td>Stainless steel - INOX</td>
</tr>
<tr>
<td><strong>MOTOR TYPE</strong></td>
<td>Gear type group 2</td>
<td>Gear type group 2</td>
</tr>
<tr>
<td><strong>OIL FLOW</strong></td>
<td>15 - 30 L/min</td>
<td>15 - 38 L/min</td>
</tr>
<tr>
<td><strong>IDEAL FLOW</strong></td>
<td>20 L/min</td>
<td>30 L/min</td>
</tr>
<tr>
<td><strong>OIL PRESSURE</strong></td>
<td>100 - 210 Bar</td>
<td>100 - 210 Bar</td>
</tr>
<tr>
<td><strong>BACKPRESSURE</strong></td>
<td>17 Bar max</td>
<td>17 Bar max</td>
</tr>
</tbody>
</table>
**SP35** Water pump 3”
**SP36** Water pump 3” ATEX

SP35 is a modern 3” submersible trash water pump with impeller and body in stainless steel. The exclusive monocanal closed impeller and the hydraulic functioning give very high efficiency: flows up to 1600 L/min, water head up to 50 mt and possibility to pump loaded fluids with suspended solids up to 35 m size.

The pump is available on request with hydraulic motor in cast iron and ATEX Certification (ATEX) for pumping flammable liquids or for uses in mines or explosive ambients. The possible applications are many thanks to the versatility and performances, can be powered by the hydraulic circuit of power packs, trucks, mini excavators, boats, fire fighting trucks and various working machinery.

Thanks to its characteristics SP35 is ideal in the professional use, in the maintenance of utility networks, in large dewatering interventions, in the civil protection, in road maintenance works.

SP36 ATEX has same performance and operational characteristics of SP35 with exception of dimension of pumpable solids and the type of hydraulic motor that on the SP36 is in cast iron.

SP36 is ATEX certified for ZONE 2.

**DISCHARGE MOUTH**
3” BSP Female

**DIMENSION cm LxH**
35 cm x H 37 cm

**WEIGHT Kg**
10

**FLOW L/min**
1600 L/min

**WATER HEAD max**
35 m

**PUMPABLE SOLIDS DIM.**
5 cm SP35

**PUMPABLE SOLIDS DIM.**
3 cm SP36

**IMPELLER TYPE**
Mono canal closed

**IMPELLER MATERIAL**
Stainless steel - INOX

**VOLUTE MATERIAL**
Stainless steel - INOX

**MOTOR TYPE**
Gear type group 2

**OIL FLOW**
15 - 38 L/min

**IDEAL FLOW**
30 L/min

**OIL PRESSURE**
100 - 210 Bar

**BACKPRESSURE**
17 Bar max

---

**SP45** Trash water pump 4”
**SP46** Trash water pump 4” ATEX

SP45 is a professional trash pump designed for pumping slurries, trash waters and thick liquids with density concentration in the fluid up to 25% and suspended solids with dimensions up 70 mm. Can be powered by power packs or by the hydraulic circuits of excavators, back hoe loaders, trucks, tractors, and all machines equipped with a sufficient circuit.

THE PUMP BODY IS FABRICATED IN STAINLESS STEEL WITH URETHANE WEAR PLATES, materials that assure hardness, resistance to abrasivity, impacts and rust.

The hydraulic functioning assure intrinsic safety and impossibility to cause electric shock. Performances are very high: flow up to 3000 L/min and water head up to 16 m. SP 45 is ideal in large movements of water, in the emergencies after floods, for sewage treatment facilities, manhole dewatering.

**DISCHARGE MOUTH**
4” BSP Female

**DIMENSION cm LxH**
40 cm x H 50 cm

**WEIGHT Kg**
28

**FLOW L/min**
3000 L/min

**WATER HEAD max**
16 m

**PUMPABLE SOLIDS DIM.**
7 cm SP45

**PUMPABLE SOLIDS DIM.**
3 cm SP46

**IMPELLER TYPE**
Centrifugal open

**IMPELLER MATERIAL**
Chromium cast iron

**VOLUTE MATERIAL**
Stainless steel - INOX

**MOTOR TYPE**
Gear type group 2

**OIL FLOW**
30 - 45 L/min

**IDEAL FLOW**
38 L/min

**OIL PRESSURE**
140 - 210 Bar

**BACKPRESSURE**
17 Bar max

---

Available the accessory SG4 fluid mixer to pump thick fluids

7 cm

Detail of the mono canal stainless steel impeller

ATEX VERSION OF SP45 IS THE MODEL SP46

---

**36**
SP55 - SP65 TRASH WATER PUMPS
For large water movements and installation on excavators arm

SP55 and SP65 are high performance submersible trash pump with hydraulic piston motor ideal in large dewatering works, in the rental activity, as “well point” pump, in the civil protection and military sector, in the sewage treatment plants and in all interventions where is necessary to move quickly large volumes of water and heavy loaded fluids.

SP55 maximum flow is 5,500 L/min (330 cm/h) with water head up to 29 mt – pumpable solids cm 5,5
SP65 maximum flow is 8,000 L/min (480 cm/h) with water head up to 39 mt – pumpable solids cm 6,5

The main characteristics are the high power and the impeller that has knives and can cut suspended solids like sea weeds, straw, rags, ropes, sediments and various linear fibers.

The hydraulic functioning gives a long series of operational and performance advantages not obtainable from traditional self priming pumps.

A typical application is with pumps featuring the bracket that allows installation on excavators arm, this version allows to use the machines as incredibly powerful pumps exploiting the hydraulic circuits of machines themselves, many are the advantages in this use: performances, quick operations, operativity in any conditions, can work in muddy terrains and difficult access points where normal pumps cannot be placed, long operative life, minimal maintenance.

<table>
<thead>
<tr>
<th></th>
<th>SP55</th>
<th>SP65</th>
</tr>
</thead>
<tbody>
<tr>
<td>DISCHARGE MOUTH</td>
<td>5,5” BSP</td>
<td>6” BSP</td>
</tr>
<tr>
<td>DIMENSION cm LxH</td>
<td>50 x H 75</td>
<td>55 x H 90</td>
</tr>
<tr>
<td>WEIGHT Kg</td>
<td>95</td>
<td>135</td>
</tr>
<tr>
<td>FLOW L/min</td>
<td>5500 L/min</td>
<td>8000 L/min</td>
</tr>
<tr>
<td>WATER HEAD max</td>
<td>29 m</td>
<td>39 m</td>
</tr>
<tr>
<td>PUMPABLE SOLIDS DIM.</td>
<td>5,5 cm</td>
<td>6 cm</td>
</tr>
<tr>
<td>IMPELLER TYPE</td>
<td>Centrifugal open with knives</td>
<td></td>
</tr>
<tr>
<td>IMPELLER MATERIAL</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>VOLUTE MATERIAL</td>
<td>Spheroidal cast iron</td>
<td></td>
</tr>
<tr>
<td>MOTOR TYPE</td>
<td>Piston type</td>
<td></td>
</tr>
<tr>
<td>OIL FLOW</td>
<td>60 - 100 L/min</td>
<td></td>
</tr>
<tr>
<td>OIL PRESSURE</td>
<td>150 - 350 Bar</td>
<td></td>
</tr>
<tr>
<td>BACKPRESSURE</td>
<td>17 Bar max</td>
<td></td>
</tr>
<tr>
<td>QUICK COUPLERS</td>
<td>3/4 BSP flush face</td>
<td></td>
</tr>
</tbody>
</table>

Available also with mounting bracket for installation on excavators arm. In this configuration the excavators and backhoe loaders become very powerful and efficient water pumps ideal in moving large water volumes.

IDEAL IN EMERGENCY SITUATIONS IN CIVIL PROTECTION INTERVENTIONS
SG4 is a accessory for trash pumps DOA models SP45 - SP55 - SP65. The accessory is a set formed by:
- **SG4 body and cylinder**, this element to be installed on the pump outlet mouth
- **Hydraulic control valve and hoses** that can control the opening/closing action of the gate

SG4 transforms the pumps in "mixers" to allow to shake and reduce to a more fluid state liquids that can be thick, loaded and viscous like those that can be found in waste water treatment plants, anaerobic digesters, API separators, petrochemical plants and refineries, environmental operations, and for moving all liquids not easy to pump.

The SG4 is a "retrofit accessory" that can be installed on pumps after the purchase, its action as mixer is necessary when the liquid to pump is very thick and have suspended solids (like sediments, mud balls or oil balls or other agglomerate of semi solid/pasty liquids) the "balls" must be disintegrated to become more fluid and be pumped, the balls neutralisation is needed also to avoid that may choke the pump inlet.

After some minutes of this treatment the liquid can be pumped better and the pump will be used in its natural function.

### TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>FLUID PASSAGE</th>
<th>equals to 6”</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL EIGHT</td>
<td>370 mm</td>
</tr>
<tr>
<td>WEIGHT</td>
<td>9 kg</td>
</tr>
<tr>
<td>CYLINDER TYPE</td>
<td>double effect</td>
</tr>
<tr>
<td>CONTROL VALVE</td>
<td>3 position open centre</td>
</tr>
</tbody>
</table>

**HYDRAULIC VALVE 3 POSITION** controls opening/closing action of SG4 windows
WATER PUMPS
CHARACTERISTICS

SP20 - SP21

WP25

SP35 - SP36 ATEX

SP45

SP55

SP65
WP116 is a modern self priming water pump with hydraulic motor. The pump is designed for the suction and evacuation of water that accidentally entered in the collecting siphons located in the lower parts of gas networks. Water can enter into gas pipes after ruptures or maintenance interventions, this mass of water accumulated in the lower part of the network can fill up the siphons and also overflowing choking the pipes and preventing the normal free gas passage that inevitably flows away by “waves” causing water entering and damaging the gas meters and creating other problems that are well known by the gas maintenance crews. WP116 is made in spark free bronze and with moving parts without metal/metal contacts so no possibility of creating localised overheated points. The hydraulic functioning (no electricity!) means implicit safety that has to be absolutely guaranteed in this delicate operation.

For the use is enough to connect the suction mouth of pump with a flexible hoses to the siphon and then prime and pump out the mixture water/gas/air, all in absolute safety and with the gas line in normal working condition. The fluid extracted has to be successively disposed according to local rules as it is a special waste. WP116 is unique in its type, for characteristics, function and safety assurance cannot miss in the equipment of modern gas maintenance crews.

**ADVANTAGES**
- Practical, robust and safe is irreplaceable in its application
- Fabricated in “spark free” anti explosive bronze
- Large water filter prevents dirt and metal chips to enter in the pump
- The water filter can be open in few seconds for cleaning and inspection
- Requires minimal and easy maintenance

**TECHNICAL CHARACTERISTICS**

<table>
<thead>
<tr>
<th>WEIGHT</th>
<th>Kg 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIMENSION</td>
<td>cm 40 x 30 x H 35</td>
</tr>
<tr>
<td>WATER FLOW</td>
<td>110 L/min @ 1 mt - 25 L/min @ 20 mt</td>
</tr>
<tr>
<td>WATER HEAD</td>
<td>20 m (2 Bar)</td>
</tr>
<tr>
<td>SUCTION HEIGH</td>
<td>6 mt</td>
</tr>
<tr>
<td>MOUTH DIMENSION</td>
<td>diameter 40 mm - suction &amp; pressure</td>
</tr>
<tr>
<td>MINIMAL DIMENSION SUCTION HOSE</td>
<td>≥ 25 mm</td>
</tr>
<tr>
<td>PUMPABLE FLUID</td>
<td>only filtered water</td>
</tr>
<tr>
<td>OIL FLOW</td>
<td>20 - 30 L/min</td>
</tr>
<tr>
<td>IDEAL OIL FLOW</td>
<td>30 L/min</td>
</tr>
<tr>
<td>OIL PRESSURE</td>
<td>100 - 210 Bar</td>
</tr>
</tbody>
</table>

*Pump should never work dry for more then two minutes, this can cause the premature wear of the seals, the pump will in few seconds prime and pump out. One minute maximum after the total evacuation of the water the pump rotation must be arrested.*
TWP40 is a modern water pump with adjustable pressures up to 40 Bar and flow up to 60 L/min, pump is designed to make test of pressure and leaks on new water networks with pipes in steel, cast iron, ductile steel and PE.

The pump characteristics and its versatility allow to perform the majority of test requested by the European norms.

The construction quality, the rational position of components, the practical controls and regulation features makes its use easy and intuitive to guarantee an use precise and problems free.

**ADVANTAGES**
- High quality two membranes pumps and engine speed reductor
- Wheels and long folding handle assure easy ground movements
- High quality water tank with large refill mouth to ease refilling and cleaning
- Twist lock attachment to allow contineous refilling of tank from the network
- Available at more price digital pressure gauge
- Pump can run dry without problems
- Chassis in eternal stainless steel square tubes

**TECHNICAL CHARACTERISTICS**

<table>
<thead>
<tr>
<th>WEIGHT DRY Kg</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td>WATER TANK CAPACITY Litres</td>
<td>30</td>
</tr>
<tr>
<td>ENGINE</td>
<td>Honda 6 Hp Gasoline - Starting recoil</td>
</tr>
<tr>
<td>FLOW max</td>
<td>60 L/min</td>
</tr>
<tr>
<td>DIMENSION AND TYPE OF WATER OUTLET</td>
<td>Female 3/8” BSP with ball valve</td>
</tr>
</tbody>
</table>

**THY2715**

THY2715 is a versatile high pressure pump with hydraulic motor that has triple function:
1. Can be used to make test of pressure and leaks on new water pipes networks in steel, cast iron, and PE
2. Can be used as powerful water pressure cleaner for external cleaning works and for hydro sand blasting to remove incrustations
3. Can be used as CANAL JET to liberate from obstructions pipe and sewers ducts from dirt, leaves, roots and other deposits

Absence of electricity and hydraulic functioning assure high power, long operative life, minimal maintenance and total safety.

Water flow is 27 L/min, pressure is adjustable up to 150 Bar (also available model WHY1520 with water flow 15 L/min, pressure 200 Bar).

A typical use is to wash the sewage trash pumps after extraction of sewers networks prior transportation on vehicles.

**WEIGHT Kg** | 15  | **DIMENSION LxWxH** | 33x26x26  |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>WATER FLOW L/min</td>
<td>27</td>
<td>WATER PRESSURE Bar</td>
<td>0-150</td>
</tr>
<tr>
<td>WATER TYPE</td>
<td>Filtered water only (Filter supplied with pump)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OIL FLOW L/min</td>
<td>20-30</td>
<td>PRESSURE Bar</td>
<td>140 - 210</td>
</tr>
</tbody>
</table>
AH15 is a tool designed for the rotation in the two senses of PIPE DRILLING MACHINES FOR HOT TAPPING CONNECTIONS operations normally necessary in the maintenance of gas and water networks. For its exclusive characteristics AH15 can be used also for the rotation of other rotary devises like: gates irrigation canals, lifting/lowering of rail road devises, rotation of reductors, ecc. The tool features a “twist type” control handle to turn clock wise and counter clock wise, ON/OFF control is proportional so can increase or reduce speed in both rotations modes, the torque force and the rotation speed can be adjusted by acting on the two valve that control these functions. The handle with spring return assures total safety, the rotation immediately stops when the operator releases the handle (“dead man” action). AH15 eliminates the fatigue and increases the productivity.

Tool can make in only 4 minutes and without fatigue an operation that if done manually normally requires at least 20 minutes.
WEIGHT: 5,5 Kg
DIMENSION LxH: 18 x 56 cm
SQUARE DRIVE SIZE: Female socket 12mm - 1/2" - Available also different dimension
FLOW L/min: 15 - 30
PRESSURE Bar: 100 - 150 Bar
ROTATION SPEED: 10 - 150 RPM Adjustable
TORQUE FORCE: 55 Nm Adjustable
ROTATION SENSES: ORARIA - ANTORARIA CW - CCW

AH15 in action on typical pipe drilling/hot tapping equipment

AH15 used in operating opening/closing the gates of irrigation canals

4 minutes is the average time to drill a 4" hole in a steel or cast iron pipe with AH15 hydraulic motor

20 minutes is the average time to drill a 4" in a steel or cast iron pipe turning the cup drill with manual rotation
**VO30** is a hydraulic tool designed to make the mechanical rotation of large water valves of urban networks, the operators knows well the fatigue and time needed when the valves are oxidised after a long period of inefficiency. Normally the operation is made with the typical "T" shaped tool, sometime with extension arms and operated manually and for many turns by two operators, now with the **VO30** is possible to make the operation in short time and without efforts, **VO30** is in substance a hydraulic motor with a ON/OFF valve that controls speed and torque and the number of rotations in real time, for its function tool must develop a high torsion force so to assure total safety the tool can be secured to a steady point by the mean of a extension tube , this will give the contrast of rotation to the extension and not on operators arm.

**VO30** is a tool safe, productive, easy to use today irreplaceable in the equipment of the modern utilities crews.

**TECHNICAL CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>WEIGHT Kg</td>
<td>17</td>
</tr>
<tr>
<td>DIMENSION LxH cm</td>
<td>100 x 25 x 25</td>
</tr>
<tr>
<td>N° OF TURNS min/max</td>
<td>22 x 82</td>
</tr>
<tr>
<td>TURNS COUNTER YES</td>
<td>with digital display</td>
</tr>
<tr>
<td>TORQUE</td>
<td>400 Nm max</td>
</tr>
<tr>
<td>TORQUE REGULATION YES</td>
<td></td>
</tr>
<tr>
<td>FLOW L/min</td>
<td>15 - 40</td>
</tr>
<tr>
<td>PRESSURE Bar</td>
<td>100 - 180</td>
</tr>
</tbody>
</table>

![Maneuver with two operators](image)
**ADVANTAGES**

- Supplied with one standard conical square sockets with dimension 40 mm.
- The ON/OFF valve allows to control in real time the speed and the torque.
- Supplied with electronic turn meter to visualise the number of turns of the valve shaft.
- Supplied with detachable extension tube to allow a longer contrast leverage.
- Possibility to install the contrast tube in the more convenient positions.
- Minimal maintenance needs.

**TYPICAL POWERING MACHINES**

Hydraulic power packs - Mini excavators - Hydraulic circuits of trucks and vans

- Old manual operation means fatigue, waste of time, potential accidents situations

- Picture shows “one man operation” with tool torsion force secured on a safe fix point

- SCORPION is the typical power pack for driving the VO30 and also other hydraulic tools

- **DIGITAL DISPLAY TO COUNT NUMBER OF TURNS**
ST225 is a pipe compressing tool for the arrest of flow of Polyethylene pipes for gas and water with diameters up to 225 mm - 9”, the tool is of the latest generation and does not have the typical limits of the similar traditional type tools that use simple “bottle type jacks”. Thanks to its exclusive characteristics assures the best results and cannot miss today in the equipment of the modern utilities underground pipes maintenance crews.

**ADVANTAGES**

- Robust hydraulic double effect cylinder with long rod guide designed to avoid deformation of the rod when in total extension (typical defect of the traditional tools with bottle type jacks)

- High quality hydraulic pump, separated pump means stability, tool remain firm on the pipe when pumping so there is not the typical rocking movement possible with the traditional tools, separated give also the possibility to work with tool in any position

- Supplied with two series of spacers for SDR 11 and SDR17 needed to avoid over compression of pipe

- The effort needed to pump is minimal thanks to the pump type and to the large cylinder

- The high power guarantees total compression also on larger pipe diameters and also in winter when the polymer is very hard

- Ideal compression quality as ST225 allows a slow re opening of the jaws after the compression, the pipe is more subject to damage in the reopenig action then during compression, traditional tools can only allow a fast re opening that can cause the phenomenon called “entanglement” of the PE fibres, the molecules of the polymer when are rapidly released after compression do not return “in order” at their original position and this often can create a point of weakness in the PE structure with consequent probable rupture of the pipe, ST225 is free of this possibility

- Supplied in strong wood box with locks for the care and transport
PIPE COMPRESSION CAPACITY
PE pipes from mm 90 to 225 (3” - 9”)

PE PIPE TYPES
SDR 11 - SDR 17

WEIGHT
55 kg without lower jaw that is detachable

TECHNICAL CHARACTERISTICS OF TOOL

TECHNICAL CHARACTERISTICS OF HYDRAULIC PUMP

PUMP TYPE
Double effect for compression and retraction

FLEXIBLE HYDRAULIC HOSE
Length 3 mt - hose SAE 100 R2 - complete with quick couplers

WEIGHT
18 Kg
PC 105 is a powerful hydraulic equipment designed for rapidly pressing pipes, in steel and polyethylene, with outside diameters up to 80 mm and wall thickness up to for 3 mm on steel pipes, and diameter 100 mm thickness 20 mm for polyethylene pipes.  
NOTE - the equipment can compress only ductile metals or plastics - NO CAST IRON - NO FRAGILE PIPES, the compression performances can vary depending on material tensile strength and upon the ratio diameter / thickness.
The equipment is irreplaceable when in emergency situations, the flow coming from a damaged pipe must be arrested. The use is practical and simple; the main tool is an hydraulic cylinder that is screwed into a cross bar. A clamp formed by two rugged jaws sliding on threaded rods is installed around the pipe to press and fastened to the cylinder/cross bar assembly by the two rods, this group is now a strong hydraulic vice that the operator can power by an hydraulic hand pump. 
The cylinder will compress the pipe till the contact of the apposite walls. 
Once the wanted effect of flow arrest is achieved will be sufficient to hold in position the jaws, blocking the nuts, the pipe will remain locked and the flow arrested. The cross bar and the cylinder assembly can be removed from the clamp wich can be left in position as long as necessary. The operation can be repeated with other clamps, in another point of pipe. (see picture 1) 
Gas and water companies - military and naval sectors, rescue and civil protection, refineries, chemical and petrochemical industries, pipe lines, depurators, power stations, under water works.

**ADVANTAGES**
- The small dimension allows to operate in restricted spaces.
- Fabrication with high resistance steel.
- The set can be used to press the pipe end before welding (“squeeze off” operation)

**TECHNICAL CHARACTERISTICS**

<table>
<thead>
<tr>
<th>COMPRESSABLE STEEL PIPES</th>
<th>max Ø 80 mm - thickness 4 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMPRESSABLE PE PIPES</td>
<td>max Ø 100 mm - thickness 20 mm</td>
</tr>
<tr>
<td>WEIGHT cylinder/cross bar Kg</td>
<td>8</td>
</tr>
<tr>
<td>CYLINDER STROKE mm</td>
<td>100</td>
</tr>
<tr>
<td>CROSS BAR WIDTH mm</td>
<td>215</td>
</tr>
<tr>
<td>HOSE LENGTH STD mt</td>
<td>4</td>
</tr>
<tr>
<td>PRESSURE Bar</td>
<td>700</td>
</tr>
<tr>
<td>HAND PUMP TYPE</td>
<td>Manual with flexible hose and couplers</td>
</tr>
</tbody>
</table>
ST10 PIPE COMPRESSING TOOL
FOR PE PIPE UP TO Ø 67 mm

ST10 is manual pipe squeezing tool designed for compressing polyethylene pipes, of gas and water, with diameters up to mm 63. The vise is manufactured for guaranteeing the maximum of practicality and safety. The sliding lever assures easy and effortless operations in any position, the upper jaw features two rotating plates that have the function of gauges for avoiding excess of compression and material yielding. The five position indicator, allows instant selection of the gauge depending on pipe diameters. The lower jaw is self-positioning and is secured to the tool by a steel cord that prevents losses. Fast, robust, easy to use, the tool does not require maintenance.

ADVANTAGES
- Five rotating spacers anti stress of fibres immediately selectable
- Completely galvanised for protection against rust
- Bronze threaded bush avoids seizing and do not need lubrication
- Lower bar with positioning grooves and fastened with flexible chain against losses
- Life guaranteed

TECHNICAL CHARACTERISTICS

| WEIGHT Kg | 4,7 |
| PIPES TYPE | PE - diam. 16-63 mm |
| MATERIAL | steel - bronze |
| DIMENSION |
| A | 300 mm |
| B | 390 mm open - 297 mm closed |
| C | 100 mm |
| D | 100 mm completely open |
| E | 54 mm |
RS 80 is a powerful hydraulic reciprocating saw designed to cut pipes made of steel, cast iron, cement and PE with diameter up to 600 mm quickly and safely. It can also cut sections, girders and metal manufactured products in linear configuration.

The hydraulic operation ensures low level of noise, no vibration, long using period, minimal maintenance, invulnerability to water and mud, and implicit impossibility of danger of electrical shock. Accurate and reliable tool significantly increases productivity and efficiency in the maintenance of gas and water networks, it should be in gear of modernly equipped teams.

**ADVANTAGES**
- No electricity means TOTAL SECURITY
- Quick and precise cuts
- Ease of use and minimal maintenance
- Blades of different lengths for different materials are available for wet and dry cutting
- The reciprocating frequency of cut is adjustable in real-time without stopping the cut
- Cut pipes up to 16 " with a freed blade without mounting the “arc guide”
- An accessory “arc guide” for long blades is available

**TECHNICAL CHARACTERISTICS**

<table>
<thead>
<tr>
<th><strong>WEIGHT Kg</strong></th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DIMENSION LxH without blade</strong></td>
<td>50 x 19 cm</td>
</tr>
<tr>
<td><strong>CUTTING CAPACITY max</strong></td>
<td>600 mm</td>
</tr>
<tr>
<td><strong>BLADE STROKE</strong></td>
<td>25 mm</td>
</tr>
<tr>
<td><strong>CUT FREQUENCY adjustable</strong></td>
<td>10 - 200 per min</td>
</tr>
<tr>
<td><strong>FLOW</strong></td>
<td>20 - 30 L/min</td>
</tr>
<tr>
<td><strong>PRESSURE</strong></td>
<td>100 - 210 Bar</td>
</tr>
</tbody>
</table>

### CUTTING BLADES

<table>
<thead>
<tr>
<th>BLADE LENGTH mm</th>
<th>MATERIAL</th>
<th>CUTTING CAPACITY</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>300</td>
<td>STEEL - CAST IRON - NON FERROUS</td>
<td>170</td>
<td>A671121</td>
</tr>
<tr>
<td>400</td>
<td>STEEL - CAST IRON - NON FERROUS</td>
<td>200</td>
<td>A671122</td>
</tr>
<tr>
<td>500</td>
<td>STEEL - CAST IRON - NON FERROUS</td>
<td>250</td>
<td>A671123</td>
</tr>
<tr>
<td>600</td>
<td>STEEL - CAST IRON - NON FERROUS</td>
<td>350</td>
<td>A671124</td>
</tr>
<tr>
<td>800</td>
<td>STEEL - CAST IRON - NON FERROUS</td>
<td>550</td>
<td>A671125</td>
</tr>
<tr>
<td>900</td>
<td>STEEL - CAST IRON - NON FERROUS</td>
<td>750</td>
<td>A671126</td>
</tr>
<tr>
<td>100</td>
<td>STEEL - CAST IRON - NON FERROUS</td>
<td>1200</td>
<td>A671127</td>
</tr>
<tr>
<td>200</td>
<td>STEEL - CAST IRON - NON FERROUS</td>
<td>200</td>
<td>A671128</td>
</tr>
<tr>
<td>300</td>
<td>STEEL - CAST IRON - NON FERROUS</td>
<td>300</td>
<td>A671129</td>
</tr>
<tr>
<td>600</td>
<td>STEEL - CAST IRON - NON FERROUS</td>
<td>400</td>
<td>A671130</td>
</tr>
<tr>
<td>800</td>
<td>STEEL - CAST IRON - NON FERROUS</td>
<td>600</td>
<td>A671131</td>
</tr>
</tbody>
</table>

### DIAMOND BLADE FOR DRY CUT ONLY

<table>
<thead>
<tr>
<th>BLADE LENGTH mm</th>
<th>MATERIAL</th>
<th>CUTTING CAPACITY</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>300</td>
<td>POLYETHYLENE - CONCRETE</td>
<td>200</td>
<td>A671132</td>
</tr>
<tr>
<td>400</td>
<td>POLYETHYLENE - CONCRETE</td>
<td>300</td>
<td>A671133</td>
</tr>
<tr>
<td>800</td>
<td>POLYETHYLENE - CONCRETE</td>
<td>700</td>
<td>A671134</td>
</tr>
</tbody>
</table>
CL10 MAGNETIC COVER LIFTER
FOR SAFE AND QUICK OPERATIONS

MADE IN ITALY
MADE IN EU

CL10 is a modern tool for crews that work in the maintenance of underground networks of water, gas, sewers, cables and reading meters services. The system is a synthesis of versatility, function, simplicity and assurance of maximum safety.

Operators know well the problems associated with an operation apparently banal like lifting a manhole cover: weight and possible accidents to the back, covers blocked by rust, dirt, asphalt, sand etc. often located in high transit roads, successive difficult repositioning in the frame and all this complicated by the large variety of covers visible on the streets that obliges to have available many of locking devices to grab the cover with various screws, hooks and lifting eyes to be connected to the lifting systems.

All these problems are solved by CL10 that is an exclusive multifunctional lifting system that fits majority of conditions being usable in 5 different ways:

- Manual lifting using CL10 magnetic plate only
- Lifting with CL10 magnetic plate and folding lever
- Lifting with two magnetic plates CL10 blocked in parallel and folding lever
- With CL10 magnetic plate and handle blocked horizontally for lifting covers hinged to the frame
- Lifting with cover grabbed by mechanical clamps and folding lever

CL10 is probably the most effective tool in its type and cannot miss in the equipment of modern utilities networks maintenance crews.
CL10 - MAGNETIC COVER LIFTER

5 WAYS OF USE - MAXIMUM VERSATILITY

1. **MANUAL LIFTING WITH MAGNETIC PLATE**
   CL10 is placed on the cover in the position nearest to the frame giving a solid blockage, it has a telescopic handle to give convenient grab to lift the majority of covers. CL10 can be detached by simply giving a strong side stroke. The operation is simple and fast.

2. **WITH MAGNETIC PLATE AND LIFTING BY LEVER**
   Using CL10 with the folding lever the effort and possible accidents on the back are totally eliminated, the operation is simple, fast and safe. The push down action turns operator weight in “a friend”, muscles and spine have a neutral vertebrae extension.

3. **WITH TWO MAGNETIC PLATES BLOCKED IN PARALLEL**
   Double lifting force.
   If the covers are too heavy or too blocked by dirt or with small magnetic contact it is possible to use two CL10 in parallel and solidly united by a small “bridge”, the contact force is doubled and lifting by lever the effort and possible accidents on the back are totally eliminated, the operation is simple, fast and safe.

4. **WITH CL10 HANDLE BLOCKED HORIZONTALLY TO LIFT HINGED COVERS**
   By simply inserting a pin it is possible to block in horizontal position the telescopic handle of CL10. In this configuration the magnetic plate becomes a practical rigid long handle to lift and reverse the covers that are hinged to the frame. The operation is simple, fast and safe.

5. **WITH MECHANICAL LOCKING AND LIFTING BY LEVER**
   To lift the more heavy and blocked covers or covers that may be “not ferrous” it is possible to use a set of mechanical fastening clamps that give a lifting eye to the lever, the clamps have different configuration to allow the insertion and fastening into the majority of covers, the lifting with clamps and lever eliminate effort and possible back accidents, the operations are simple, fast and safe.

SPECIAL CLAMPS ON CUSTOMER SPECIFICATIONS ARE ALSO AVAILABLE

**VANTAGGI**

- End of accidents and back injuries, no efforts, easy to use, in the use with lever pushing down the operator weight that becomes “friend”, the spine is relaxed and is not compressed.
- Magnet is very powerful and just “at contact” strongly blocks any ferrous cover
- Versatile! It can block any ferrous surface: grilled, grooved, curved or with little contact
- Easy to transport and store, with minimal size and weight (magnetic plate only 6.5 Kg, lever 7,5 Kg)
- Maintenance free, made in robust steel with powder paint, life guarantee and “made in UE”!
CL10 - MAGNETIC COVER LIFTER

CL10 MAGNETIC PLATE

Is a powerful magnet with a lifting force that in ideal conditions arrives to 500 Kg, the telescopic “T” handle that gives an ergonomic grab, can be detached from the cover simply giving a strong side stroke with extended handle. When stored the magnetic base must be kept if possible away from metal objects that could be difficult to successively detach.

ONLY ONE PRECAUTION - Like any magnet normally used in all industries is advised to keep CL10 away from credit cards, mobile phones, watches and “pace makers” as it may interfere with their function.

LEVER WITH WHEELS

Robust and light (only 7.5 Kg) its configuration and the extensible handle allow easy lifting and side movements.

Avoids that back muscles and spine are subject to a dangerous compression, the push down action turns operator weight in “a friend”, muscles and spine have a neutral vertebrae extension. Use is fast and simple, when folded the wheels are blocked to prevent unwanted sliding, occupies minimal space and does not need maintenance.

SET OF CLAMPS FOR MECHANICAL LIFTING BY LEVER

Have “wing” and hook configurations to fit and grab the majority of the covers. Clamps give “lifting eye” to the lever, insertion is easy and quick can be done with one hand only (without needing annoying fixing works with vulnerable butterfly nuts, screws etc always necessary on other similar lifters), it is enough to push the spring to expose the locking wing, rotating it and engaging the cover. Clamps are galvanised anti oxidation and supplied in a unique cluster kept together by a rod to avoids loss and keep all ready for use.

Special clamps are available on customer specifications, contact DOA for more information.

CONNECTION BRIDGE FOR COUPLING TOGETHER TWO CL10 IN PARALLEL

Allows to joint as unique solid block two magnetic plates to double the contact and the lifting force using the lever.

LB7 COVER LIFTER LEVER

Robust, light and versatile lever with beaks ideal in the majority of operations of lifting covers and grilles of all type, the double flat beaks with tip in hard tempered steel can be inserted into the contact slot between covers and frame, hook up and resist to strong leverages, torsions and hammering, the beaks are configured also to scrape and clean the lifting cavity of covers from asphalt crusts and dirt. The lever is the ideal combination in the use with CL10 magnetic cover lifter, is manufactured with the best materials and treatments, it is life guaranteed.

Length 75 cm - Weight 1.2 Kg

ADVANTAGES

- Construction in 38NCD4 steel with zinc galvanisation finishing.
- The plastic handles guarantee a firm grip also with gloves
- The back of “D” handle is a “fulcrum point” to ease lifting leverage
- Is for characteristics and function the ideal alternative to the rough use of traditional pickaxe
Practical and versatile tool designed to ease the removal of the cover from the manholes frame that are stuck by rust, ice, stones, asphalt incrustations and inactivity. The wedge penetration effect of the tip, between the frame and the cover, creates a strong lateral pushing force that splits easily the incrustations formed by sediments that block the opening, just a couple blows and the separation/detachment is done, fast, powerful and safe.

**MZ120 offers ergonomic “Standing Up” operations** (no more needed to get on the ground on your knees to bit the cover with hammers like usually can be seen, this is an uncomfortable/unsafe operation with possible chippings and splinters that can strike the worker face), the tapered tip is in hardened steel and it is the same used on pneumatic demolition breakers.

Other uses of the tool are:

- **using the tool as a scraper** to strongly erase the hard layer of dirt that remains in the lower surface between the cover and frame to clean up and reobtain a plan contact surface
- **using the tool chisel bit as practical asphalt cutter** to easily cut the asphalt layer that often cover the edge and riopen the contact line between the manhole cover and the frame to allow lifting
- **using the tools as strong long lever** to release the latch that blocks the round hinged covers and then to leverage for lifting like a pickaxe

**MZ120** is a modern accessory that simplifies a seemingly simple operation like lifting a manhole cover, is ideal in combination with **CL10 magnetic lifter**

**MZ120** is an exclusive product of DOA srl with **LIFE TIME WARRANTY**

---

<table>
<thead>
<tr>
<th><strong>WEIGHT</strong></th>
<th>Kg 8</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LENGTH</strong></td>
<td>cm 130</td>
</tr>
<tr>
<td><strong>MATERIAL</strong></td>
<td>hardened steel</td>
</tr>
</tbody>
</table>
VEKTOR is a hydraulic cart designed for the operations of leaks localisation in underground gas networks, the cart makes in autonomy and safely the vertical drilling of road surfaces avoiding the possibility, always present, to enter in manual contact with high voltage electric cables, situation that can cause severe accidents or the death.

VEKTOR is powered by hydraulic power packs and allows to make multiple holes in short time without manual contacts, so without vibrations on operator hands assuring long operations that are prohibited in manual drilling, this eliminates the fatigue and assures intervention speed.

Use is simple, the operator simply position the cart on the point to drill, push the penetration lever and the hole will be done automatically without any hand contact, in the holes will successively be inserted the “gas sniffing probe” of the leak detection instrument.

On the cart can be installed also the hydraulic core drill AK46 to make multiple holes with diamond core bits on pavements in concrete or stones. The absence of electricity makes it implicitly safe, it can work even under the rain (operation prohibited with electric drills), VEKTOR is a unique tool and cannot miss today in the equipment of modern crews that works in the maintenance of gas networks.

**COMPONENTS AND ADVANTAGES**

1. **Drilling foot**, keeps the cart firm during the drilling.
2. **Driving handle**, assures good manoeuvrability and saves space when transported.
3. **Hydraulic distribution block** with control levers for the down / up / stop of the drilling and for the ON/OFF of tool rotation.
4. **Flow divider valve** that separates the incoming flow dividing it in two lines, to the tool and to the penetration cylinder.
5. **Drill rig column**, is a drilling guide with a hydraulically balanced cylinder that automatically dose the penetration pushing force and speed depending on the soil hardness, force is relented if soil is hard and increase if soil is soft, this guarantees the best performances in any condition, the drill rig is available in two lengths for different strokes: stroke cm 40 or for stroke cm 90 (in the illustration).
6. **System for quick attachment of the tool**, allows to detach the tool to use it manually in points not accessible to the cart, for example between two cars in parking lots.
7. **Hydraulic drill**, can be of two types: or with SDS MAX bits (elicoidal type) for use on mix soil s like those on asphalted roads and for “non frequent” holes on stones pavements, or with sinker drills for holes on hard and stone paved soils, drill bits with attachment standard Hex mm 22 x 108.
8. **Stainless steel chassis** with wheels and brakes that avoid the cart to move when left inclined on down hill or during transport.
9. **Ballast weights**, are detachable metal blocks that give contrast weight to the pushing penetration force.

**TECHNICAL CHARACTERISTICS**

| WEIGHT Kg | 60 with ballast and drill |
| DIMENSION cm LxWxH | 90 x 45 x H 135 for holes 40 cm - 90 x 45 x H 185 for holes 90 cm |
| FLOW L/min | 30 - 38 L/min |
| PRESSURE Bar | 140 |
| AVERAGE DRILLING SPEED | 45 seconds for holes Ø 19 mm on asphalt road |

The machine may have different performance characteristics and dependent on the customer’s specifications and the many possible variants such as: type of drill used, soil type, diameter and type of drills, unit used, and so on.
Hydraulic valves for the control of flow and pressure, assure that tools are supplied with the correct hydraulic values for safety and avoid damages to the equipment, the valves body is in laminated aluminium with anodised surface, the cartridge elements are of the best quality to assure a stable and precise regulation.

**RFP 50 FLOW / PRESSURE CONTROL VALVE**
The regulated flow is fixed and pre set at the factory and cannot be changed, this fix configuration of the output flow avoids manumission and errors.
Customer must require the needed regulated flow at the order.
The valve can receive a maximum incoming flow of 60 L/min.
The valve can regulate the following fixed flows:
15 - 21 - 25 - 30 - 36 L/min
The regulated pressure valve must be adjusted by the customer.

**DIMENSION L x P x H**
130 x 100 x 50 mm

**FLOW IN max**
60 L/min max

**REGULATED FLOWS**
15 - 21 - 25 - 30 - 36 L/min

**MAXIMUM PRESSURE IN**
250 Bar max

**REGULATED PRESSURES**
10 - 200 Bar

**PORT THREAD IN**
3/4” BSP female

**PORT THREAD REG**
1/2” BSP female

**RFP 50V FLOW / PRESSURE CONTROL VALVE**
The output regulated flow is adjustable according to necessity in any moment,
The valve can receive a maximum incoming flow of 60 L/min.
The valve can regulate a maximum flow of 38 L/min.
The regulated pressure valve must be adjusted by the customer.

**DIMENSION L x P x H**
130 x 100 x 50 mm

**FLOW IN max**
60 L/min max

**REGULATED FLOWS**
0 - 36 L/min

**MAXIMUM PRESSURE IN**
250 Bar max

**REGULATED PRESSURES**
10 - 200 Bar

**PORT THREAD IN**
3/4” BSP female

**PORT THREAD REG**
1/2” BSP female

RFP50 - RFP50V are supplied with short hoses and quick couplers as shown in illustration

**RFP 70 FLOW / PRESSURE CONTROL VALVE**
Both threads in pressure nad regulated side are 1” BSP
Hydraulic valve for the control of flow and pressure, assure that tools are supplied with the correct hydraulic values for safety and avoid damages to the equipment, the valves body is in laminated aluminium with anodised surface, the cartridge elements are of the best quality to assure a stable and precise regulation.
The valve can receive a maximum incoming flow of 90 L/min
The valve can regulate a maximum flow of 50 L/min
The output regulated flow is adjustable according to necessity in any moment.
The regulated pressure valve must be adjusted by the customer.

**DIMENSION L x P x H**
150 x 150 x 65 mm

**FLOW IN max**
90 L/min max

**REGULATED FLOW**
0 - 50 L/min

**MAXIMUM PRESSURE IN**
350 Bar max

**REGULATED PRESSURES**
10 - 250 Bar

**PORT THREAD IN**
1” BSP female

**PORT THREAD REG**
1” BSP female

RFP 70 valve is supplied with 1/2” flush face quick couplers only in the regulated side as shown in illustration
CT100 tool is a service item necessary to make the service of DOA breakers, like all hydraulic breakers DOA hammers are equipped with a nitrogen accumulator that in case of failure has to be replaced and recharged with nitrogen at a pressure between 35 - 40 Bar.

CT100 allows to open up the check valve of the accumulator, to adjust the recharging nitrogen pressure and to close the check valve.

1. ADAPTER, the adaptor can be separated from the tester body
2. RING NUT OF THE ADAPTER
3. VALVE FOR DISCHARGING THE EXCESS OF PRESSURE
4. HANDLE FOR OPENING CLOSING THE VALVE CAP
5. NITROGEN INLET IN THE TESTER
6. PRESSURE GAUGE
7. INTERNAL ALLEN KEY THAT OPEN/CLOSES THE VALVE CAP ACTING ON THE HANDLE

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>WEIGHT - LENGTH</th>
<th>2.5 Kg - 50 cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLOW Max</td>
<td>60 L/min</td>
</tr>
<tr>
<td>PRESSURE Max</td>
<td>210 Bar</td>
</tr>
<tr>
<td>BACKPRESSURE Max</td>
<td>60 Bar</td>
</tr>
</tbody>
</table>
The hydraulic tools produced by companies that are members of EHTMA are marked with triangular stickers showing an alphabetical letter that can be C, D, E or F. This denotes the functional hydraulic characteristics of the tool, making them visually evident. This classification has been planned and standardized by EHTMA, the European Hydraulic Tools Manufacturers Associations.

EHTMA has defined a number of functional standards for hydraulic tools and their circuits. The standards refer to the flow and pressure values that a tool must work on. This classification is represented by colored triangular symbols with four different alphabetical letters in the centre: C, or D, or E, or F.

This classification ensures recognition of the operative data of the hydraulic tool and to match its compatibility with the circuits of power packs or other hydraulic machines. This guarantees against mistaken connections, avoiding damage to the equipment and possible accidents.

**NOTE:** The above hydraulic characteristics apply to all hydraulic tools of EHTMA standard, some DOA hydraulic tools that mount standard industrial hydraulic gear motor can work also with pressures above 140 Bar up to a maximum of 210 Bar, this means that developed output performances of DOA rotary tools can be higher if tool can use oil pressure higher than 140 Bar.

### HYDRAULIC FUNCTION CHARACTERISTICS OF TOOLS AND POWER PACKS

<table>
<thead>
<tr>
<th>Category</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLOW (min - max)</td>
<td>15-24 L/min</td>
<td>26/34 L/min</td>
<td>35-45 L/min</td>
</tr>
<tr>
<td>RELIEF VALVE SETTING</td>
<td>150 - 165 Bar all categories</td>
<td>150 - 165 Bar all categories</td>
<td>150 - 165 Bar all categories</td>
</tr>
<tr>
<td>TOOL OPERATING PRESSURE</td>
<td>≤ 140 Bar lower or equal to 140 Bar</td>
<td>≤ 140 Bar lower or equal to 140 Bar</td>
<td>≤ 140 Bar lower or equal to 140 Bar</td>
</tr>
<tr>
<td>MAXIMUM TOLERABLE BACK PRESSURE</td>
<td>17 Bar (250 PSI) ideal zero Bar</td>
<td>17 Bar (250 PSI) ideal zero Bar</td>
<td>17 Bar (250 PSI) ideal zero Bar</td>
</tr>
<tr>
<td>HYDRAULIC OIL TEMPERATURE</td>
<td>MAXIMUM 60° C (140° F) at the maximum expected ambient temperature</td>
<td>MAXIMUM 60° C (140° F) at the maximum expected ambient temperature</td>
<td>MAXIMUM 60° C (140° F) at the maximum expected ambient temperature</td>
</tr>
<tr>
<td>OIL RADIATOR HEAT REJECTION CAPACITY</td>
<td>Category C</td>
<td>Category D</td>
<td>Category E</td>
</tr>
<tr>
<td></td>
<td>3 HP (2.24 kW)</td>
<td>5 HP (3.73 kW)</td>
<td>7 HP (5.22 kW)</td>
</tr>
</tbody>
</table>
| NOTE: Do not operate tools at an oil temperature above 60° C; if tool is used at higher temperature this can cause skin burns and reduce the tool life.

### HYDRAULIC OIL FILTER

Minimum filtration value required: 20 μ - micron
Filter must be sized for flow of at least 120 L / min
HYDRAULIC OIL AND TABLE OF EQUIVALENTS BRAND AND TYPE

Viscosity at the lower expected ambient temperature: max 68 cSt (9° E)
Viscosity at the higher expected ambient temperature: min. 22 cSt (3.10° E)
(cSt = centistokes       ° E = gradi Engler)

FOLLOWING CHART SHOWS COMMON HYDRAULIC OILS - USE THESE FLUIDS OR THEIR EQUIVALENTS

<table>
<thead>
<tr>
<th></th>
<th>COLD CLIMATES</th>
<th>HOT CLIMATES</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGIP</td>
<td>ARNICA 32</td>
<td>ARNICA 46</td>
</tr>
<tr>
<td>BP</td>
<td>ENERGOL SHF- HV 32</td>
<td>ENERGOL SHF- HV 46</td>
</tr>
<tr>
<td>CASTROL</td>
<td>HYSPIN AWH-M 32</td>
<td>HYSPIN AWH-M 46</td>
</tr>
<tr>
<td>TOTAL</td>
<td>EQUIVIS ZS 32</td>
<td>EQUIVIS ZS 46</td>
</tr>
<tr>
<td>ESSO</td>
<td>UNIVIS N 32</td>
<td>UNIVIS N 46</td>
</tr>
<tr>
<td>MOBIL</td>
<td>DTE EXCEL 32</td>
<td>DTE EXCEL 46</td>
</tr>
<tr>
<td>Q8</td>
<td>HANDEL 32</td>
<td>HANDEL 46</td>
</tr>
<tr>
<td>SHELL</td>
<td>TELLUS T 32</td>
<td>TELLUS T 46</td>
</tr>
<tr>
<td>GAZPROM NEFT</td>
<td>HYDRAULIC HDZ 32</td>
<td>HYDRAULIC HDZ 46</td>
</tr>
<tr>
<td>TEXACO</td>
<td>Rando HDZ 32</td>
<td>Rando HDZ 46</td>
</tr>
</tbody>
</table>

**For arctic conditions (-30° 0°C) use shell tellus arctic 32.
Indicated oils are intended for temperate climates, for extreme temperatures oils contact DOA.

WARRANTY

All parts fabricated by DOA are guaranteed for a period of 12 MONTHS from the date of delivery to the customer only on defects of material, workmanship and assembly.
The period of warranty coverage begins from the date of shipment-mailing of the warranty card supplied with the tools.
The warranty card must be mailed to DOA within 10 days from delivery to customer.
Costs of labour and transports are not covered by warranty and must be borne by the customer.
The parts and components not produced by DOA such as engines, compressors, alternators, etc. are covered by the warranty of the manufacturers.
The power pack batteries and wear out items such as: breakers chisels, drill bits, cut off discs, flexible hoses, quick couplers or accessories that are without an identification serial number are covered by a warranty limited at 3 months from the date of delivery or activation of the service.
DOA reserves the right to substitute in warranty at its own expenses and at its plant only those parts recognized to be defective after an examination of the DOA engineers. In the case the repairs under warranty are made by the customer, DOA will reject any charge for labour costs.
There are not other warranty explicit or implicit and in any case cannot be imputed to DOA any responsibility of patrimonial order or reimbursement of any type deriving from problems of products breaking under the period of warranty.
All the characteristics, technical data and illustration of the DOA products are informative and not binding.

**DOA reserves the right to make improvements modification at any time without obligations at any time and without previous notice on units already sold.**
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info@doa.it
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HYDRAULIC TOOLS
DOA produces the largest hydraulic tools range available today in EU
The range is in constant evolution to give innovative solutions, improving safety
and productivity eliminating risks and fatigue.